

# **TECH** **TERMS**

**SECOND EDITION**

National Association of  
**NAB**  
BROADCASTERS

A Techno-Field Guide  
to explain everything you need  
to know to survive in today's  
global communications business

# TECH TERMS

Second Edition

*National Association of*  
**NAB**  
BROADCASTERS®



Published by NAB Research and Planning Department  
© Copyright, 2000, National Association of Broadcasters  
ISBN #0-89324-296-9

Reproduction or publication of the content, in whole or in part, without expressed permission from NAB is prohibited. No liability is assumed with respect to the use of the information contained herein. Copies of *Tech Terms, Second Edition* are available through NAB Publications Services, 1771 N Street N.W., Washington, DC 20036-2891. For ordering information, please write, or call NAB Services toll free 1-800-368-5644.

# CONTENTS

<b>Table of Contents</b> .....	iii
<b>List of Figures</b> .....	v
<b>List of Tables</b> .....	ix
<b>Contributing Authors</b> .....	xi
<b>Number Terms</b> 2B+D – 1394 / 5C Protocol .....	1
<b>A</b> A&B Signaling – Azimuth .....	4
<b>B</b> B2B – Byte .....	24
<b>C</b> C – Cycles Per Second .....	38
<b>D</b> D/A – DYUV .....	65
<b>E</b> E-Business – E-zine .....	96
<b>F</b> Facility – Fuzzy Logic .....	108
<b>G</b> .gz – GW - Ground Wave .....	122
<b>H</b> HAAT – Hz .....	130
<b>I</b> IBAC – IXC .....	138
<b>J</b> Jack – JPEG .....	155
<b>K</b> k - kilo – Ku-Band .....	156
<b>L</b> L-Band – Lynx .....	157
<b>M</b> M-II – MVDS .....	162
<b>N</b> NABTS – Nyquist Frequency .....	176
<b>O</b> Object – Overload .....	183
<b>P</b> PABX – PWM - Pulse Width Modulation .....	190
<b>Q</b> QA - Quality Assurance – QWERTY .....	207
<b>R</b> Radio – RS-232 .....	209
<b>S</b> S-Band – System .....	216
<b>T</b> T-1 – Two-Way .....	241
<b>U</b> UART – UUencode/UUdecode .....	251
<b>V</b> V.90 – VTR .....	255
<b>W</b> W-VHS – WYSIWYG .....	266
<b>X</b> X.25 – XMS – Extended Memory Specification .....	279
<b>Y</b> Y (Luminance) – Y°UV Color System .....	279
<b>Z</b> Z (Impedance) – Zulu Time .....	280
<b>Appendix</b> Acronyms/Information on Industry Organizations, Associations, Committees, Groups .....	281
<b>Index</b> Listing of Terms .....	295



# FIGURES

Figure 1	3G is Now .....	1
Figure 2	700 MHz Band Auction .....	3
Figure 3	A/D Conversion .....	4
Figure 4	ACTS Satellite/Terrestrial Network .....	7
Figure 5	Top 10 Ad Banners Viewed .....	8
Figure 6	ADSL Distribution Networks .....	10
Figure 7	Aliasing .....	12
Figure 8	Amplitude Modulation .....	13
Figure 9	Aspect Ratio .....	18
Figure 10	Azimuth .....	23
Figure 11	Examples of Banner and Side Bar Ads .....	27
Figure 12	Monochrome Bitmap Example .....	31
Figure 13	Comparative Wireline Data Rates .....	34
Figure 14	Top 10 Potential Global Markets for Broadband Wireless Access .....	35
Figure 15	U.S. Cable Penetration .....	39
Figure 16	Cable Network Schematic .....	40
Figure 17	Residential Cable Telephony Subscribers, 1998-2005 .....	41
Figure 18	Code Division Multiple Access (CDMA) .....	45
Figure 19	Typical Cellular Pattern .....	46
Figure 20	Worldwide Wireless Cellphone Market .....	47
Figure 21	European Cellphone Market Penetration .....	47
Figure 22	Cellphone Growth (U.S.) .....	48
Figure 23	Cellular Frequency Pattern .....	48
Figure 24	Clarke Orbit .....	51
Figure 25	Client/Server System .....	53
Figure 26	Client/Server Local Area Network .....	53
Figure 27	Client/Server Architecture and the World Wide Web .....	53
Figure 28	Telephone Central Office (CO) .....	55
Figure 29	Coaxial Cable .....	55
Figure 30	TV Channel Characteristics .....	58
Figure 31	Connectivity .....	60
Figure 32	Convergence Forces .....	61
Figure 33	Converging Sectors .....	61
Figure 34	Example of a CU-SeeMe Session .....	65
Figure 35	Daisychain .....	67
Figure 36	Data Broadcasting Transmission in Active Video Portion of TV Signal .....	68
Figure 37	Data Broadcasting Model I .....	38

Figure 38	Data Broadcasting Model II .....	39
Figure 39	Digital Data Broadcasting .....	69
Figure 40	Datacasting Model .....	71
Figure 41	Datacasting System .....	72
Figure 42	Digital Datacasting Operations .....	72
Figure 43	DBS - Direct Broadcast Satellite .....	74
Figure 44	Interactive DBS Future .....	75
Figure 45	Differential Global Positioning System .....	78
Figure 46	Digitization and Compression Process .....	79
Figure 47	Percent of U.S. Households with a Telephone, Computer and Internet Use ....	80
Figure 48	DirecPC .....	82
Figure 49	Continuing Convergence .....	82
Figure 50	Directional Antenna .....	83
Figure 51	Disk Anatomy .....	84
Figure 52	Japan's NTT i-Mode - Wireless Explosion .....	86
Figure 53	Domain Name Registration .....	87
Figure 54	Layout of Dvorak Keyboard .....	94
Figure 55	E-Business Outreach .....	96
Figure 56	E-Commerce Forecast .....	96
Figure 57	E-Commerce Projections .....	97
Figure 58	Multimedia Consumer Content Spending Worldwide .....	101
Figure 59	Online Consumer Spending Worldwide on Electronic Media Content .....	101
Figure 60	Projected Worldwide Consumer Spending on Media .....	101
Figure 61	Elliptical Orbit .....	103
Figure 62	FDDI Ring .....	109
Figure 63	Types of Filters .....	111
Figure 64	Examples of Flyaway .....	114
Figure 65	Semi-Redundant Uplink System Configuration .....	114
Figure 66	Frequency Modulation .....	115
Figure 67	Satellite Footprint .....	115
Figure 68	ITU World Regions for Frequency Allocations .....	117
Figure 69	U.S. Table of Allocations .....	118
Figure 70	Frequency Shift Keying .....	120
Figure 71	Satellites in Geostationary Orbit .....	123
Figure 72	GIS Thematic Overlays .....	125
Figure 73	GPS - Global Positioning System .....	126
Figure 74	Television Grade B Signal Contour Map .....	127
Figure 75	Handheld Wireless .....	130
Figure 76	Handwriting Recognition - PalmPilot's Graffiti System .....	131
Figure 77	Example of an E-mail Header .....	132
Figure 78	Example of a Home Page .....	135
Figure 79	Sample HTML Document .....	136
Figure 80	Input/Output Computer Interface .....	138

Figure 81	Interlace Scanning Scheme .....	145
Figure 82	Online Ad Spending Breakdown .....	147
Figure 83	Worldwide Online Advertising Forecast .....	147
Figure 84	Wireless Internet Appliances .....	148
Figure 85	PCs vs Internet Appliance Shipments: 1997-2002 .....	148
Figure 86	Interoperability .....	150
Figure 87	IP Multicast .....	151
Figure 88	IP Unicast .....	151
Figure 89	ISDN .....	152
Figure 90	iSKY – How it Works .....	153
Figure 91	iSKY – Services .....	153
Figure 92	LATA - Local Access and Transport Area .....	157
Figure 93	The Wireless Broadband Access Market .....	159
Figure 94	Microcomputer .....	166
Figure 95	Middleware Client/Server Network Architecture .....	167
Figure 96	U.S. MMDS Systems with Highest Penetrations .....	168
Figure 97	Example of a Motion-Capture Bodysuit .....	170
Figure 98	MP3 Devices .....	171
Figure 99	MTS – Multichannel Television Sound .....	172
Figure 100	Digital Multicast .....	173
Figure 101	Multiplexing .....	174
Figure 102	Navigating the Net .....	177
Figure 103	Example of NetMeeting Session .....	178
Figure 104	NC System – Thin Client .....	179
Figure 105	Nyquist Sampling.....	182
Figure 106	Average Number of Hours Spent Online Per Month .....	184
Figure 107	U.S. Online Households.....	185
Figure 108	“Actively” Connected Online Households in the U.S. ....	185
Figure 109	Time Spent Online .....	185
Figure 110	Online Language Populations .....	185
Figure 111	Optical Fiber .....	187
Figure 112	Paging Operations .....	190
Figure 113	One-Way and Advanced Messaging /Paging Subscribers – 1999-2004 .....	191
Figure 114	PCS Band 1850-1990 MHz .....	193
Figure 115	PCS System Schematic .....	193
Figure 116	U.S. Wireless Market Forecast.....	194
Figure 117	Example of a Peer-to-Peer Network.....	195
Figure 118	Household PVR Penetration .....	196
Figure 119	Ka-Band Aeronautical Communications .....	197
Figure 120	Types of Satellite Orbits .....	201
Figure 121	Signal Propagation .....	204
Figure 122	Quaternary Phase-Shift Keying (QPSK) .....	207
Figure 123	Quantization .....	207

Figure 124	FM Stereo Signal with RBDS Subcarrier .....	209
Figure 125	Original RBOC Regions .....	210
Figure 126	Remote Sensing – 1 Meter - 20 Meter Samples .....	212
Figure 127	Sampling .....	216
Figure 128	SCSI Network .....	219
Figure 129	Projected SDARS Growth .....	220
Figure 130	SDARS Projected Subscriber Growth .....	221
Figure 131	SNG Vehicle .....	228
Figure 132	Electromagnetic Spectrum .....	231
Figure 133	Potential Spot Beam Pattern .....	233
Figure 134	Example of a Spreadsheet Table .....	233
Figure 135	Spread Spectrum: Frequency Hopping .....	234
Figure 136	Star Topology .....	236
Figure 137	Streaming Media .....	237
Figure 138	Streaming Media Search Engines .....	238
Figure 139	FM Stereo Signal Subcarriers .....	239
Figure 140	Time Division Multiplexing .....	242
Figure 141	TDMA .....	242
Figure 142	Threaded Discussion Example .....	246
Figure 143	Satellite Uplink/Downlink .....	252
Figure 144	Understanding URLs .....	253
Figure 145	VBI - Vertical Blanking Interval .....	256
Figure 146	VCR Household Penetration .....	257
Figure 147	Video Signal .....	259
Figure 148	Architecture of a Typical VSAT System and A Mesh-Connected VSAT Network .....	264
Figure 149	WAN- Wide Area Network .....	266
Figure 150	Pirated Software .....	267
Figure 151	PC and Wireless Web Access .....	268
Figure 152	Example of Web Clipping .....	268
Figure 153	Web Advertising Spending by Industry Category – 1999 .....	269
Figure 154	Webcasting's on Digital Business Radar Screen .....	270
Figure 155	Number of Websites Worldwide .....	270
Figure 156	Potential Broadband Wireless Access Revenues (North America 1999 - 2008) .....	274
Figure 157	U.S. Wireless Industry Subscribers .....	274
Figure 158	U.S. Wireless Industry Revenues .....	275
Figure 159	Projected U.S. Wireless Market Growth .....	275
Figure 160	Wireless Data Services .....	276
Figure 161	Wireless Web Devices .....	276
Figure 162	Wireless Internet Appliance .....	277

# TABLES

Table 1	Wireless Mobile Network Evolution .....	1
Table 2	FCC Spectrum Auctions .....	20
Table 3	Electromagnetic Frequency Bands .....	25
Table 4	Bandwidth .....	26
Table 5	Examples of Digital Video Data Rates .....	26
Table 6	16-Bit Binary Code and Decimal Equivalents .....	30
Table 7	Digital Hierarchy .....	34
Table 8	Standard External Bus Architectures .....	37
Table 9	Frequency Bands – Letter Designations .....	38
Table 10	Top Cable MSOs .....	40
Table 11	High-Speed Internet Access (DSL vs Cable) .....	40
Table 12	Telco CLASS Service .....	52
Table 13	Example of a Cookie File .....	62
Table 14	Selling Domain Names .....	66
Table 15	Digital Data Rate Measures .....	70
Table 16	Digital Transmission Rate Measures .....	70
Table 17	U.S. DBS Growth Estimates – 1998-2010 .....	74
Table 18	DSL – Theme and Variations .....	90
Table 19	Symmetric DSL Service .....	91
Table 20	Asymmetric DSL Service .....	91
Table 21	Telephone Digital Signalling Standards .....	92
Table 22	Projected DTV Set Growth .....	93
Table 23	E-Commerce Markets .....	97
Table 24	Television Grade B Service .....	127
Table 25	Video Graphics Adapter Standards .....	128
Table 26	Internet Growth .....	146
Table 27	Internet Address Classes .....	146
Table 28	Top 10 Internet Advertising Domains .....	147
Table 29	Top 15 Countries – Internet Users .....	149
Table 30	Internet Home Usage (U.S.) .....	149
Table 31	Mark-up Languages .....	163
Table 32	Microprocessor Standards .....	166
Table 33	Modem Transmission Speeds .....	169
Table 34	Multimedia PC Standards .....	174
Table 35	Open Systems Interconnection (OSI) Model .....	188
Table 36	PVR Players .....	196

Table 37	Common Internet Communications Protocols .....	204
Table 38	NTSC TV Color Matrix .....	214
Table 39	SONET Transmitting Standards .....	230
Table 40	Selected Technical Standards-Setting Bodies .....	235
Table 41	Digital Storage/Channel Capacity Measures .....	237
Table 42	T-Carrier Classes .....	241
Table 43	VCR Decks .....	256
Table 44	Popular Vector Graphics File Formats .....	257
Table 45	VOD Market Estimates .....	263
Table 46	World Wide Web Basic Elements .....	268
Table 47	Top Websites Visited .....	271
Table 48	Top 10 Web Properties (U.S.) .....	271
Table 49	Top Television Websites .....	271

# AUTHORS

**Arthur W. Allison, III**, Senior Engineer in the NAB Science and Technology Department. He earned his BSEE from Clemson University in 1966. After a period with the Central Intelligence Agency and running a small business, he joined The Arbitron Company. He was the chief architect in developing Arbitron's television electronic meter system and oversaw its installation and operation in eleven U.S. cities over a 15-year period. Mr. Allison earned his Masters of Engineering Administration from George Washington University in 1981. He integrated the technical and operational systems for the Mediafax Television electronic rating system in Puerto Rico. He joined Smart House in 1992 and guided the transition of their home automation system to commercial availability. He joined NAB in 1995 where his responsibilities include technical issue management with a focus on policy and technical developments of advanced television systems including areas of HDTV, industry convergence, multimedia, fiber optics, cable/telephone issues, and new television technologies.

**Marcia L. De Sonne**, Director of Technology Assessment for the National Association of Broadcasters, Washington, D.C. Responsibilities include examining advanced technologies, market applications, policy developments, and domestic and international business directions affecting broadcasting, cable, satellite and telecommunications markets worldwide. She is the author of numerous industry publications and studies and a frequent speaker at industry forums addressing critical technological developments and their emerging consumer and business market impacts. Publications include: "Tech-Terms" First Edition, 1996 (contributing author and Executive Editor), "International DTH/DBS," 1996 (editor); "Wireless Communications," 1996 (editor); "The Datacasting Business," 1996 (editor); "Convergence: Transition to the Electronic Superhighway," 1994, (contributing author and Executive Editor); "DBS: The Time is Now," 1994 (co-author/editor); and "Multimedia 2000: Market Developments, Media Business Impacts, and Future Trends," 1993 (contributing author/Executive Editor). Ms. De Sonne has an interdisciplinary Master of Science in Telecommunications Policy, Law, and Engineering from George Washington University, Washington, DC, and a B.A. in research/political science from The Catholic University of America, Washington, DC. Additional graduate studies concentrated on the development of U.S. foreign technology policy and U.S. space policy at Georgetown University and George Washington University, both in Washington, DC.

**Jeffery Rutenbeck**, Ph.D. is an associate professor in the School of Communications at the University of Denver, Denver, Colorado. He is founder and current director of the University's Digital Media Studies Program – a joint academic effort among the School of Art, the School of Communication and the Department of Math and Computer Science. He came to Denver University in 1989 from Microsoft Corporation where he worked on the software development team of Word for Windows 1.0. Dr. Rutenbeck has done technology consulting for many corporations and universities in the areas of new media, Internet technologies, digital curriculum development, and computer education. He also conducts research in the areas of media history, media theory and Internet culture.

**Robert E. Yadon** is a professor of information and communication sciences, and the co-director of the applied research institute, at the Center for Information and Communication Sciences,

Ball State University. Previously, he was vice president of television operations at the National Association of Broadcasters. Prior to his stay at NAB, he was a member of the graduate faculty at Michigan State University, and then at the University of Oklahoma. Over the past 15 years he has authored a number of articles, book chapters and manuscripts on broadband services and technologies, telecommunication strategies, and multimedia applications, and appeared before organizations including the International Engineering Consortium (IEC), the Institute of Electrical and Electronics Engineers (IEEE), and the National Association of Broadcasters (NAB).

# NUMBER TERMS

### 2B + D

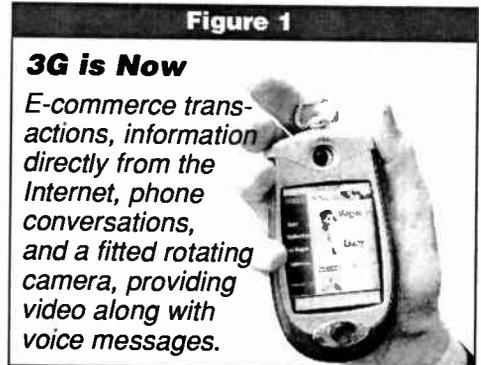
A type of ISDN service offered by telephone companies that uses two bearer (B) channels and one data (D) channel, denoted as 2B + D. (See B-Channel, BRI)

### 3G

A reference to the proposed next- or third-generation (3G) of broadband communications systems. Particular focus is on development of potential mobile services and wireless broadband systems for Internet access among other high-speed applications. (See Wireless Internet)

### 8 VSB/16 VSB

Two variations of a digital data transmission technique that can be used by television broadcasting stations. Using this technique, either 8 or 16 discrete amplitude levels of information are digitized and transmitted over the so-called vestigial sidebands (VSB) of the main television carrier signal. (See Vestigial Sideband)



Source: Ericsson

Table 1

## Wireless Mobile Network Evolution

Technology/Platform		Time Line			
		1st Generation (1G)	2nd Generation (2G)	2nd Generation Modified (2.5G)	3rd Generation (3G)
Analog	AMPS	Mobile Cellular Phone			
	Digital				
CDMA (Code Division Multiple Access)	Digital Cellular Phone (9.6 - 14.4 Kbps)		Digital PCS (Personal Communication Service)	cdma2000 1X (307 Kbps) [QUALCOMM]	w-cdmaOne
					W-CDMA (Wideband CDMA 2+ Mbps) cdma2000 3X [QUALCOMM]
TDMA (Time Division Multiple Access)	Digital Cellular Phone/Data		Digital PCS	GPRS (General Packet Radio Service) (115 Kbps) [Ericsson]	EDGE (Enhanced Data Rates for Global Evolution) (384 Kbps - 2 Mbps)
					TDMA-IS 136
GSM (Global System Mobile)	Digital GSM (PCS) (Wireless Phone/Data)				
i-Mode					i-Mode (2 Mbps) [NTT]

Source: NAB

## 10 Base-T - 700 MHz Auction

### 10 Base-T

Refers to the standard digital Ethernet LAN system that is commonly used for data networks transmitting at a maximum of 10 Mbps. The "10" in 10 Base-T refers to the maximum throughput of the network. "Base-T" denotes the transmission medium, where T refers to twisted-pair (telco standard RJ-45) copper data/phone lines. Other Ethernet mediums include 10 Base-F for fiber and 10 Base-2 for coaxial cable. (See 100 Base-T)

### 24/7

Increasingly popular slang for activities, organizations, e-commerce businesses etc., that are operating continuously around-the-clock, 24 hours a day/ 7 days a week.

### 50 Hz/60 Hz

50 Hz (Hertz meaning cycles per second) refers to the power line frequency used in most European, Asian, and African countries, whereas 60 Hz is the power line frequency used in the Americas. For electronic compatibility reasons, these respective power line frequencies were adopted as the basis for broadcast television field scanning rates by countries in these various regions. The U.S. analog NTSC television standard is based on 60 scanning lines per second and European TV standards (PAL and SECAM) are based on 50 video scanning lines. With today's improved video technologies, reasons to match TV systems to local power lines no longer exists. For example, the U.S. is nearing the adoption of a digital ATV/HDTV broadcast transmission standard that will have multiple video scanning rates.

### 56k Line

A standard narrowband line leased from a local phone company, which has a full digital carrying capacity of 64 kilobits-per-second, but the line typically, carries voice or data traffic at a rate of only 56 kilobits-per-second. The remaining 8 kilobits are dedicated to carrying phone system signaling information. As a result, a 56K line is not considered to be a so-called "clear channel."

### 64 kbps

Measured in terms of digital data rate this is the standard capacity of a "clear channel" ISDN telephone line. (See Clear Channel, ISDN)

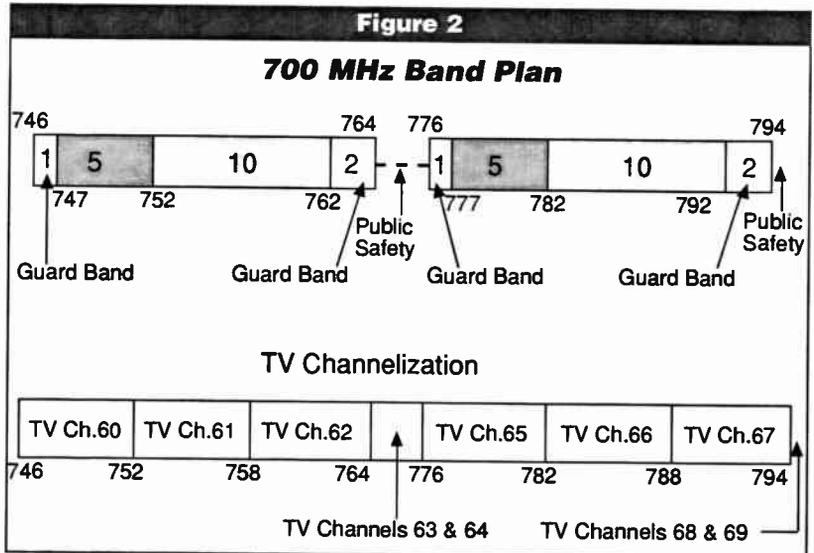
### 100 Base-T

A version of a digital Ethernet LAN system called Fast Ethernet, which has ten times the capacity of a regular 10 Base-T Ethernet system. A 100 Base-T system has a transmission capacity of 100 Mbps over twisted-pair Category 5 (CAT-5) lines, which is the highest grade of copper telephone/data line available.

### 700 MHz Auction

The FCC's 700 MHz auction in May 2000 is for two blocks of spectrum from 746 MHz through 664 MHz, and from 776 MHz through 794 MHz. The portion of spectrum between the two blocks up for auction were originally designated for UHF television channels 63 and 64, and now have been assigned for public safety use. According to the FCC, there are few, if any, restrictions on the eligibility of bidder for these licenses, as well as on permissible services which could range from broadband wireless Internet access to 3G (third-generation) mobile wireless service to digital broadcasting. Due to the growing number of parties competing for access to spectrum resources, and relatively unrestricted eligibility and use requirements, the 700 MHz auction may become a national referendum on future communications technologies in the convergence era. The capacity of a license is for as much as 20 MHz of spectrum, which contrasts to only 6 MHz for a television station license, 10-15 MHz for SMR licenses such as Nextel, and 25 MHz for

cellular licenses. According to George Reed-Dellinger of Washington Analysis, "the 700 MHz auction is likely to create a deal of hype [regarding] the possibility of a cellular-ized, broadband, one-stop-shopping, super supplier for multimedia services" and thus invites bidding by leading e-commerce companies such as Cisco and Microsoft. *TeleMedia Update*, March 1, 2000. Contact: 202/659-8030.



### 1394/5C Protocol

A peripheral digital base band interface protocol operating over the IEEE1394 standard with copy protection per the so-called "five company" method. The protocol is intended to allow a set-top box to send MPEG-2 compressed digital high-definition (HD) programming streams which cannot be decode by a consumer's set-top box, to another decoder device which is capable of handling HD streams in order to display the signal on a viewer's television set. The protocol has been standardized as SCTE/DVS-194, and is specified as an "interface" by OpenCable.

## A&B Signaling - A/V

# A

### A&B Signaling

In telephone T-1 line transmissions, some of the capacity of the line has to be dedicated to internal signaling, or call setup. A&B signaling is the process of taking one digital bit of information at a constant interval from each of the 24 sub-channels on the T-1 line in order to let the system know that an active call is still in place. (See T-1)

### A/B Rolls

The practice of using two video sources simultaneously during the process of editing. An A/B roll in editing means mixing together video footage from two separate tape machines onto a master copy. For example, when recording a video dissolve, one piece of video is faded or dissolved into another picture.

### A/B Switch

A switching device enables a user to select a desired signal from two different sources. A/B switches are required to be available on television sets connected to cable systems allowing viewers to switch from an off-air television broadcast signals to cable or vice versa.

### A/D - Analog to Digital Conversion

The process of converting or transferring a signal from analog to digital. Analog and digital are two different ways of sending voice, data, or video signals. To convert a signal from its natural analog state (continuous and linear) to digital, the signal must first go through a filter. The filter makes sure that no frequencies are out of the digital sampling range. In the conversion process, analog signals are measured many times in a process called sampling. Each sample of the analog signal is then converted to a discrete digital number based on its approximate amplitude at that instant it is measured. (See Sampling)

Figure 3

### A/D Conversion



The picture is divided into many small blocks



One block is divided into 8 x 8 pixels

20	20	20	20	20	20	20	20
30	25	20	20	20	20	20	20
140	30	25	20	20	20	20	20
145	140	30	25	20	20	20	20
150	145	140	30	25	20	20	20
150	150	145	140	30	25	20	20
150	150	150	145	140	30	25	20
150	150	150	150	145	140	30	20

Decimal values of pixels

63	3	0	0	0	0	0	0
-2	-1	1	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

Decimal values of pixels after DCT and quantization

Source: CED Magazine, April 1996

### A/V - Audio/Visual

A traditional reference to any type of electronic network, set-up, or connection used to provide both audio and video material to end-users (e.g., what are your A/V requirements?). The term also often is used to refer to any type of electronic programming content that can be seen and heard (e.g., we need your A/V clip). A more contemporary reference to computer-developed programming materials containing audio and video but also other electronic media content or "multimedia." (See Multimedia)

**NAB**

**AC-3**

A standard established by the U.S. Advanced Television Systems Committee (ATSC) for the transmission of compressed digital audio signals. The standard supports surround-sound in addition to other audio features. Technically it is documented as ATSC standard A/52.

**AC Power**

Alternating Current (AC) is the type of electrical power commonly available in residential homes; electrical wall outlets carry 120-volts of AC. It is possible to convert from AC power to another electrical system referred to as DC (direct current), or convert from DC to AC. (See DC)

**Accelerated Graphics Port (AGP)**

Refers to an improved interface system for managing the hardware (called "graphics cards" or "graphics accelerators") in a personal computer, which in turn controls the processing of graphical information. AGP enables graphics accelerators to gain faster access to PC system memory (Random Access Memory, or RAM). This faster access to RAM allows a graphics accelerator much more access memory capacity than is available locally on a PC's graphics card. For example, to display an image containing 20MB of graphical "textures," an 8MB AGP graphics card could quickly and easily access the PC system memory for the additional 12MB required to display the image. AGP graphics have quickly become a standard for use with computer games, design programs, and other graphic-intensive computer applications. (See Graphics Adapter, RAM)

**Access Code**

A short sequence of digits allowing a user to access a specific facility, service, feature or function of a telecom network, computer system, or secure Website .

**Access Node**

Point in the local telephone network where numerous access lines are consolidated into a smaller number of feeder lines. Typically, access lines are multiplexed onto digital loop carrier (DLC) systems supporting T1-rate transmission. Other examples of access nodes are cellular antenna sites, PBXs, and Optical Network Units.

**Account**

Refers to the granting of permissions and rights of use to someone on a multi-user computer system. An account usually includes a unique user name and a password that are both entered when a user wants to gain access to the computer system. Some computer systems designed or set-up to be used by a single user assume that anyone using that particular machine is the original authorized user, and thus do not allow the creation of formal accounts. Now that PCs commonly are connected to an internal private network, users often are required to login to their personal computers to gain access to other resources on the network, such as printers, fax machines, data archives, the Internet, etc. (See Authentication, Login, Password)

**Accunet**

Digital long-distance transmission services provided by AT&T. There are several varieties of Accunet services available ranging from packet switching to T-1 line transmission. (See Packet Switching, T-1)

**Acoustic Coupler**

An early modem device used to connect a computer to a telephone network using traditional dial-up voice circuits. Acoustic couplers relied on sound waves transmitted through the air to send and receive data. The acoustic modem was equipped with cup-shaped devices containing small

**Acrobat - Active Server Pages**

microphones, which snugly fit over the two ends of the old standard telephone handset. The digital computer data was converted to sound and then transmitted over the telephone voice line.

**Acrobat™**

A platform developed by Adobe systems that uses a "portable document format" (pdf) for creating, delivering and printing documents regardless of the computer system used to create or produce them. Acrobat preserves the "look" of the original document if that document is transferred over a network system. This attribute is unlike some other software programs in which document files may lose certain formatting during an electronic transfer. Due to its format preservation advantages, Acrobat is commonly used to distribute forms, manuals, spreadsheets, and many other types of highly formatted file content that are transmitted over the relatively narrowband Internet system. (See PDF, Plug-in)

**ActiveX™**

A set of software programs developed by Microsoft which are designed to provide interactive control of content files transmitted over electronic communication networks, especially the Internet. Similar in concept to Java, developed by Sun Microsystems, ActiveX delivers small "applet"-sized programs that can be embedded in a Web page to produce multimedia effects, enhanced page layout, or add other interactive features that users may choose to activate on-demand. (See Applet, Java.)

**Active Matrix**

A type of digital display screen technology in which there is a single active transistor to control each point (pixel) that makes up the video screen. Active matrix display technology allows video images to be much sharper than previous styles of liquid crystal displays (LCDs) such as those found in many laptop computers. (See LCD, Pixel)

**Active Matrix Display**

A type of liquid crystal display (LCD) where each display element (each pixel) includes an active component such as a transistor to maintain its appearance and refresh its appearance frequently. One of the most common types of active-matrix display uses a technology called "thin film transistor (TFT)". In most cases, the terms "active matrix" and "TFT" is used interchangeably (See LCD, Pixel).

**Active Server Pages™ (ASP)**

Refers to a set of solutions created by Microsoft, Corp. specifically for use by Internet website providers. Similar to Common Gateway Interface, ASP software allows for complex interactions between the Web pages that are viewable by users on a specific website, and other software tools that a company or organization may make available for retrieval of specific information. For example, Active Server Pages commonly are being used to allow a Web user to search certain company databases that are made available via the company's own website. If a user is interested in the retail pricing information of a particular product or service offered by the company, ASP would enable the Web user to fill out a pre-set form on the website to request this information. After submitting the request form, ASP acts to retrieve the information from the database containing this current pricing information. The final step enacted by ASP is to load the desired information back onto a Web page for viewing by the user. Active Server Pages also are used to enable Web users to add their own information to an existing database for use by a website provider. An example here may be when a user signs up to receive an electronic newsletter or receive weekly news updates from a brokerage house. A user provides a set of information by filling in a pre-set Web form and submitting the information (e.g., name, email address, etc.) for

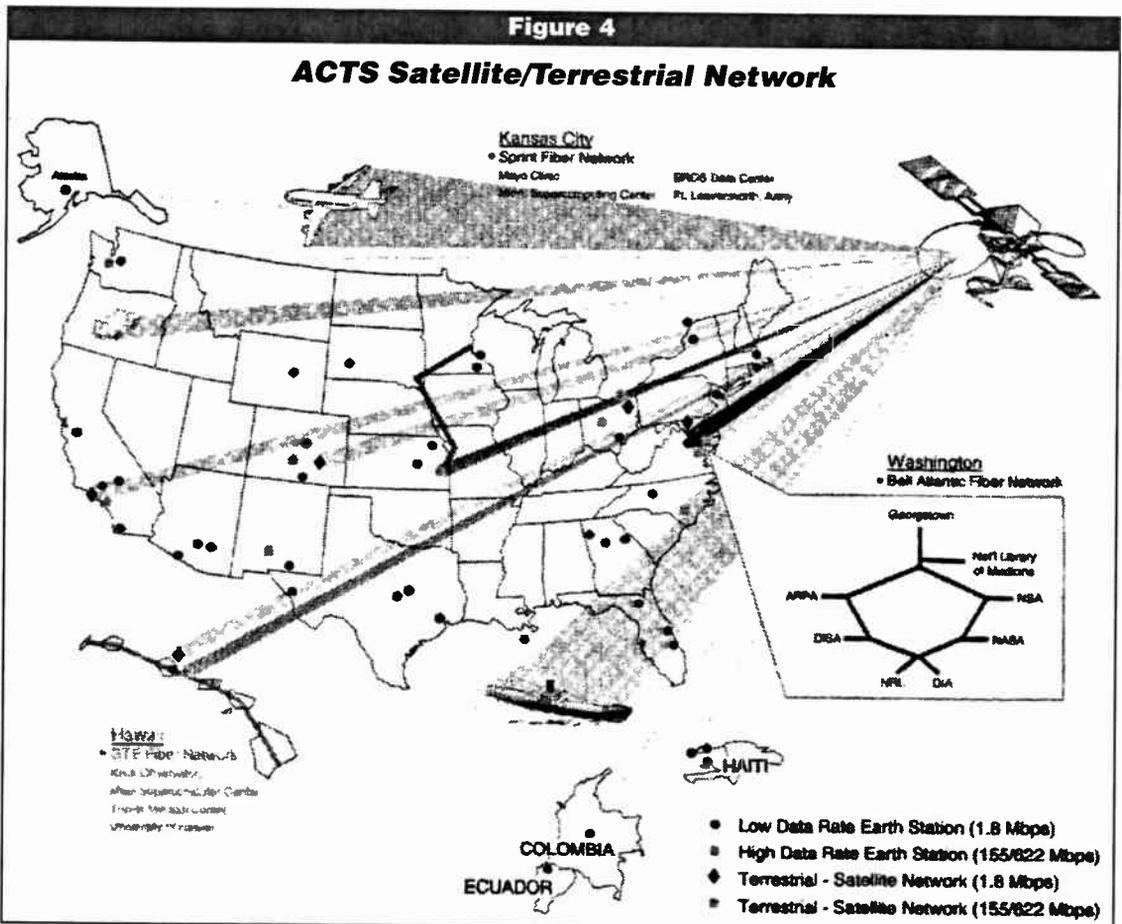
storage on a particular website's database. (See Common Gateway Interface, E-commerce, Web Server.)

**Active Video Lines**

The number of video picture scans lines that actually are being used for the purpose of picture generation in television broadcast transmissions. Active lines are the total number of scanning lines minus those lines devoted to the vertical blanking interval (VBI). In the standard analog NTSC television system, 525 scan lines are available for television picture transmission, however, broadcast television stations only uses about 484 of these lines for the visible picture. Most television sets cannot reproduce this number of video lines. The remaining scanning lines making up the VBI are used for a variety of internal signaling, text, closed captioning, data transmission or other station or network purposes. (See NTSC, VBI)

**ACTS - Advanced Communications Technology Satellite**

A commercial prototype satellite developed by NASA and first launched in 1993. ACTS is a primary R&D program for experimental testing of key technologies including antennas with high-power frequency hopping multiple beams, onboard processing and switching, and previously unused Ka-band transmitters and ground-based receivers. The system's experimental capabilities have been made available to U.S. industry, government, and university experimenters.



Source: NASA

## ACTV - Ad View

Based on ACTS testing, next-generation commercial satellites will support high data rate gigabit-per-second ATM networks. (See ATM)

### ACTV - Advanced Compatible Television

Otherwise known as Extended Definition Television (EDTV), this television transmission standard was developed by the David Sarnoff Research Center as a system that would bridge the gap between the current analog NTSC standard and a future digital high-definition television (HDTV) standard. ACTV is no longer being promoted or actively pursued as standard for television transmission.

### ACU - Automatic Calling Unit

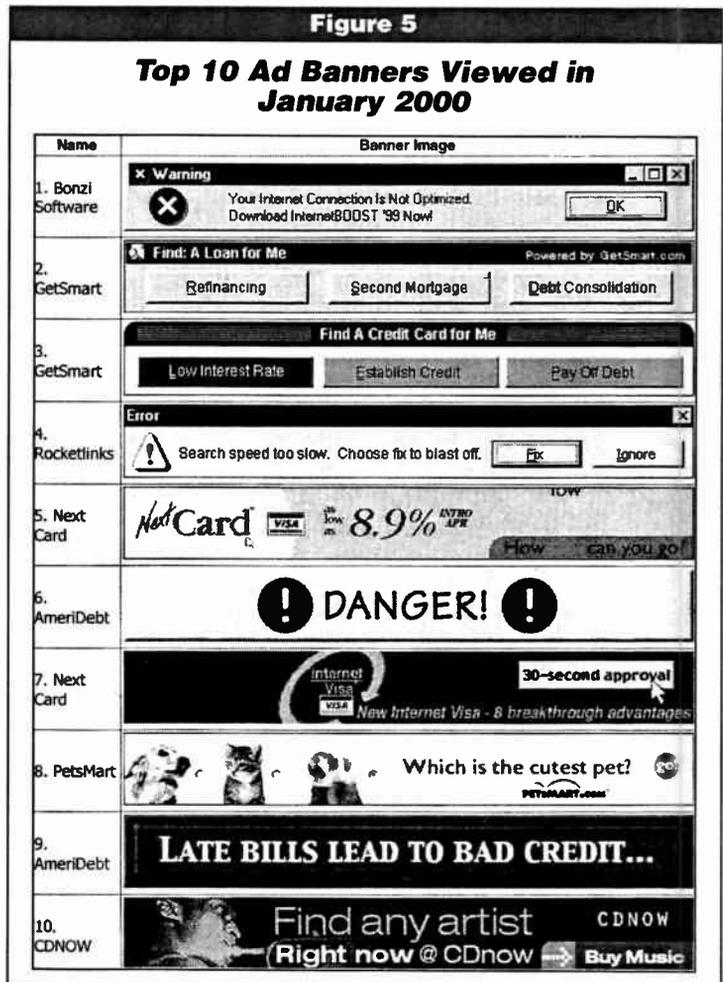
A device that can be programmed to automatically place telephone calls via computer interface eliminating the need for human action to place the calls.

### Ad Banner

Refers to an advertising message contained within a banner heading (typically a rectangular box) prominently located at the top of a commercial Web page. The Internet Advertising Bureau ([www.iab.net](http://www.iab.net)) has set standard sizes for different banner shapes and also the preferred download times for these advertisements. Ad banners – or banner ads as they also are called – usually are composed of text messages but also may incorporate animation, audio or video features. A typical screen size for an ad banner is 7" x 3/4" or 468 x 60 pixels. (See Ad View, Banner Ad)

### Ad View

Refers to the number of times viewers downloaded a website banner advertisement within a specified period of time. The actual number of times the advertisement was seen by viewers may be higher due to "caching" which is an automatic computer process to download a graphic once but provide multiple viewing opportunities. In the advertising world, an "ad view" is relatively equivalent to an ad "exposure" in traditional media contexts. (See Banner Ad)



Source: Nielsen/NetRatings; March 2000

**Adapter Card**

A printed circuit board that can be installed in a personal or desktop computer to provide connectivity to an input or output (I/O) device. Adapter cards are connected to the basic PC “bus” which in turn is connected to the CPU. (See Bus, CPU, I/O)

**Adaptive Routing**

A digital data routing technique using computer software to automatically select the most efficient route for transmission traffic. This technique allows for faster data transfers as it reduces bottlenecks and heavy congestion points in a network.

**ADC - Analog to Digital Converter**

An electronic device that converts analog signals to digital data bit streams enabling the signal data to be further manipulated, encoded, and transmitted over digital circuits. (See A/D)

**ADCT - Adaptive Discrete Cosine Transform**

(See DCT)

**Address**

The location of a person or node in a computer network from which information is sent or being transferred to. Typical computer networks, whether small or large, have multiple nodes connected to it such as user workstations, or system routers, switches, and hub points. Access to an individual node is dependent upon the system being able to recognize a specific destination on the network. This applies to in-house local area networks (LANs) or Wide Area Networks (WANs) such as the Internet. Routing information, such as electronic mail, becomes more complex over the Internet because it is actually a network of networks. To send information, a common addressing scheme is needed or some ability to convert addresses from one network to another so that each node has a unique address and the system can recognize where to send information packets.

**Addressability**

Refers to the technical capability of a communication system for controlling the delivery of programs or other services to select subsets of subscribers on the system. In the cable industry, addressable control allows a cable operator to remotely activate, disconnect or unscramble a specific channel or service received by a subscriber from the cable headend. Upon notification from a subscriber via an upstream activation channel the cable system acknowledges the subscribers addresses and resets the signaling scheme in the subscriber's set-top box temporarily enabling the subscriber's box to unscramble the desired pay TV, PPV or VOD program signal permitting the subscriber to view the program. (See Encryption, PPV, VOD.)

**Adjacent Channel Interference**

Interference caused when two or more channels are placed in frequency bands that are too close together on the spectrum.

**ADSL - Asymmetrical Digital Subscriber Line**

A form of Digital Subscriber Line in which the bandwidth available for downstream connection is significantly larger than for upstream. Although designed to minimize the effect of crosstalk between the upstream and downstream channels, ADSL is well suited for Web browsing and client-server applications, and it also provides a voice channel. The data-rate of ADSL depends on the length and quality of the line connecting an end-user to the telephone company's central

**ABIOS - AT Bus**

office. The upstream data flow is usually between 16 and 640 kilobits per second while the downstream data flow is between 256k and 9 megabits per second. (See Cable Broadband, DSL)

**Advanced Basic Input/Output System (ABIOS)**

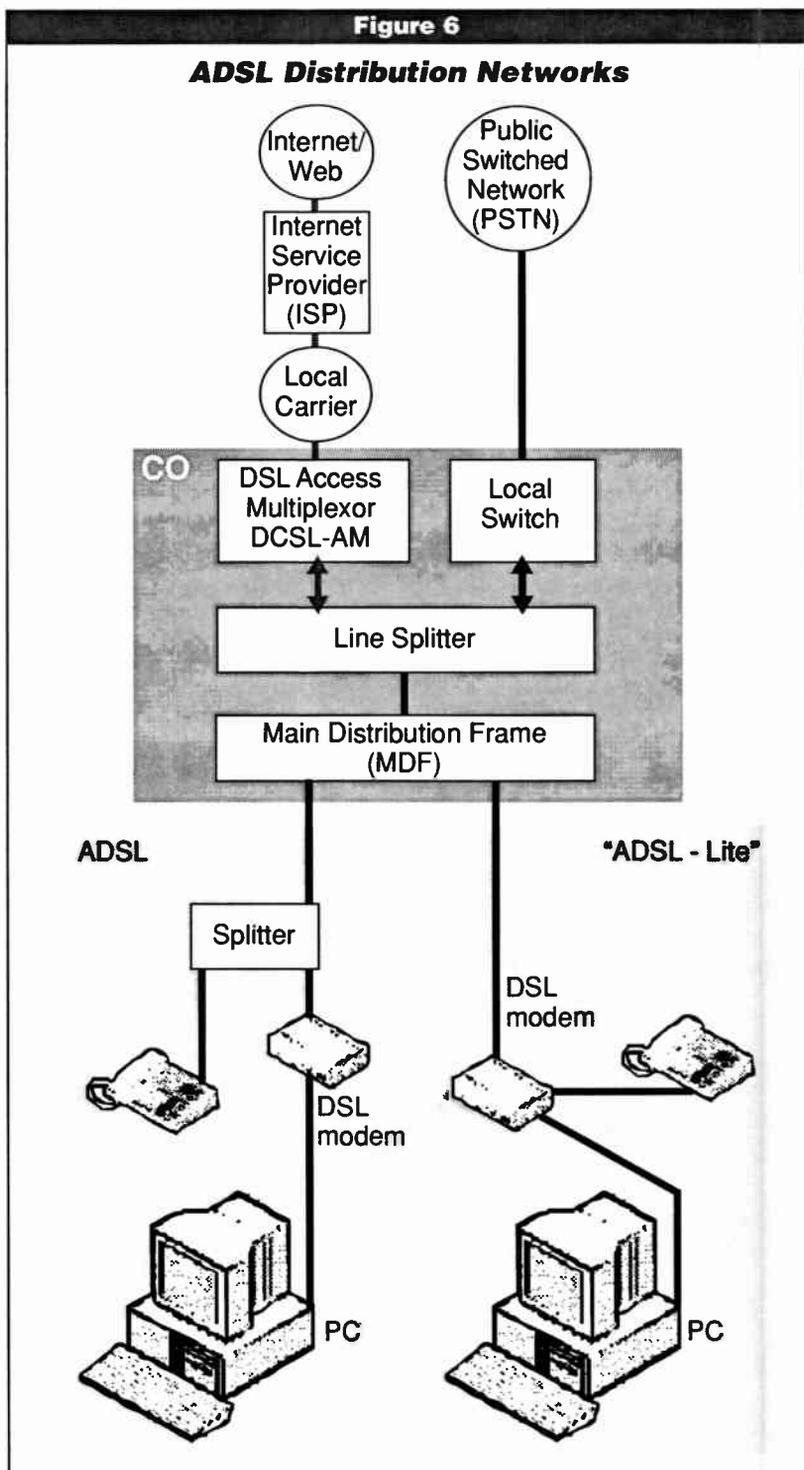
Computer software programs that act as buffers to enable personal computer applications to "talk" or communicate with various hardware components. (See BIOS)

**Advanced Encryption Standard**

An initiative directed by the Federal Government to develop a Federal Information Processing standard that specifies an encryption algorithm capable of protecting sensitive government information. The algorithm is intended to replace the current Digital Encryption Standard (DES). The new encryption standard is expected to be implemented by the U.S. government and adopted on a voluntary basis by the private sector. (See Encryption, PKI)

**Advanced Technology Bus (AT Bus)**

Term refers to the basic 16-bit bus system incorporated into Microsoft/Intel-based personal computer systems. AT Bus technology connects the computer's motherboard to various periph-



Source: Bell Atlantic

eral devices. By becoming the de facto standard for personal computer (PC as distinct from Apple' MacIntosh) systems, the original AT bus formed the basis of the Industry Standard Architecture (ISA) bus architecture for desktop computers. (See ISA)

### **Agent**

Refers to a computer program that is designed to perform some information-gathering or other computing tasks in an automated way. It is becoming popular to conceive of agents that perform complex Internet searches, do online shopping, or help plan a trip, all with minimal interaction required by the user. (See AI, Bot, Expert System, Intelligent Agent).

### **AI - Artificial Intelligence**

Refers to a growing number of high-level software programming systems that strive to enable computers to emulate human-like decision-making functions. Once considered merely science fiction, AI systems would allow robot androids to function much like humans, effectively making the artificial from the real indistinguishable. Today, AI applications most commonly are employed in computer systems providing capacities to process and integrate vast amounts of information well enough to come to decisions without defined responses being specifically written into software code. (See Agent, Bot, Expert System, Intelligent Agent)

### **AIFF (Audio Interchange File Format)**

A format developed by Apple Computer Inc. for storing high-quality audio and musical instrument information in digital form. The format is also used by Silicon Graphics workstations for working on audio and musical files. (See Digital)

### **AIN - Advanced Intelligent Network**

Reference to the integrated telephony network of the future. Essentially, short-hand jargon or buzzword used in the long-distance and local phone industries to describe a future network with built-in software "intelligence" that enables it reroute digital calls any time during a phone conversation, not only at the beginning. Wireless cellular telephone networks employ a similar technical concept whereby calls constantly shift from one frequency to another while users travel in and out of cell areas. The components of the network communicate using out-of-band signaling, or via separate signaling network typically using the Signaling System 7 (SS7) protocol. (See Out-of-band Signaling, SS7)

### **Alias**

A false name, moniker or invented set of alphanumeric characters created by a computer user as a personal identifier code, or ID name. Aliases are usually short and easy to remember as well as quickly key in as text to gain access to a computer or online system. An alias acts as a substitute for a person's real name, or in some cases it substitutes for a string of characters that is relatively long and/or difficult to remember. Aliases are commonly used in online chat sessions to establish a fictitious identity, or as a shorthand code name for posting comments on Internet message boards. (See Chat, Forum, Newsgroups, Usenet)

### **Aliasing**

A technical condition in which undesirable effects are produced during the digital conversion process due to the sampling rate being too low to faithfully reproduce image detail. This occurs when original data or information changes more quickly or shifts more radically than can be captured accurately by the digital sampling process. This results in the incomplete or false reconstruction of the text, picture or graphical material. For example, in the case of video, jagged edges show up at boundaries during major changes in a video frame, such as shifting from picture

## Algorithm - Alternate Routing

data to text. Normally these jagged edges are technically smoothed-out in a second process to enhance viewing. (See Anti-aliasing)

### Algorithm

A specific set of mathematical calculations used to solve a problem or determine an outcome. An example is the set of calculations used in signal encryption schemes or in digital video compression techniques. (See Compression)

### Alphanumeric

Refers to written text using a set of characters that may contain combinations of alphabetic letters and numbers (0 to 9). For example, in a database application the place for entering user addresses would be designated by an alphanumeric field containing both house and/or apartment number and street name.

### ALT - Alternative Exchange Carrier

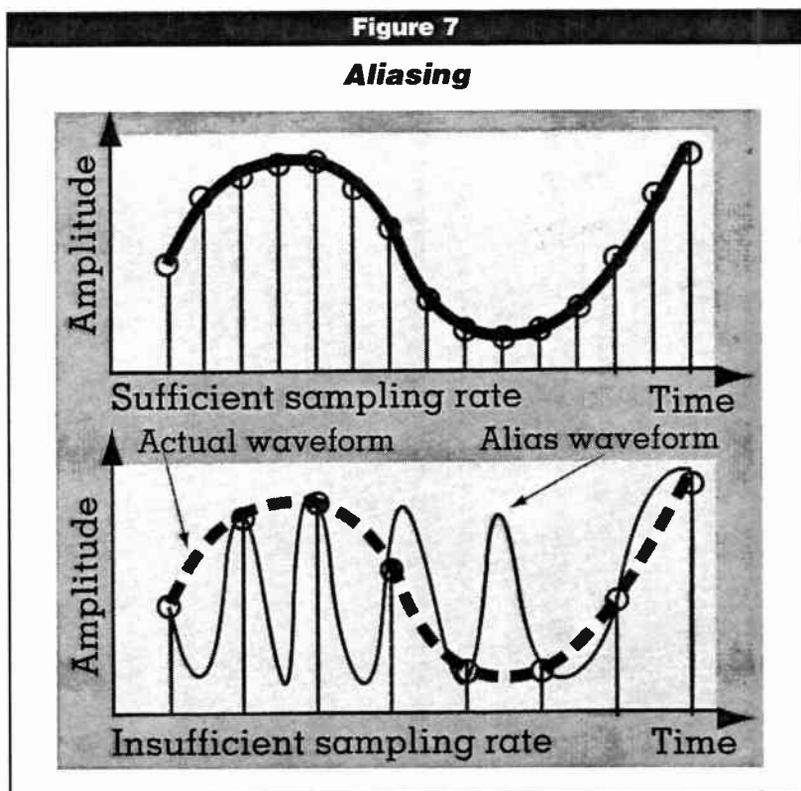
Refers to non-RBOC telecommunications carriers that are a growing segment of today's telecom marketplace. ALTs are private companies offering competitive priced telephony and data network services, which are especially, targeted at high-volume, high-security businesses such as banks, financial investment firms, and Wall Street brokerages. ALTs are telco "by-pass" companies seeking to leverage higher service quality, faster upgrading, and lower costs into larger shares of the \$100+ billion U.S. telecommunications market.

### Alt Key

Refers to the Alternate Key on a personal computer keyboard that functions like a second control key and makes commands available while the user holds down the Alt key and presses another key. For example, in all Windows applications holding down the Alt key and pressing the "F" key drops down the File menu. On a Macintosh computer the equivalent key is known as the "Option key." (See Control Key)

### Alternate Routing

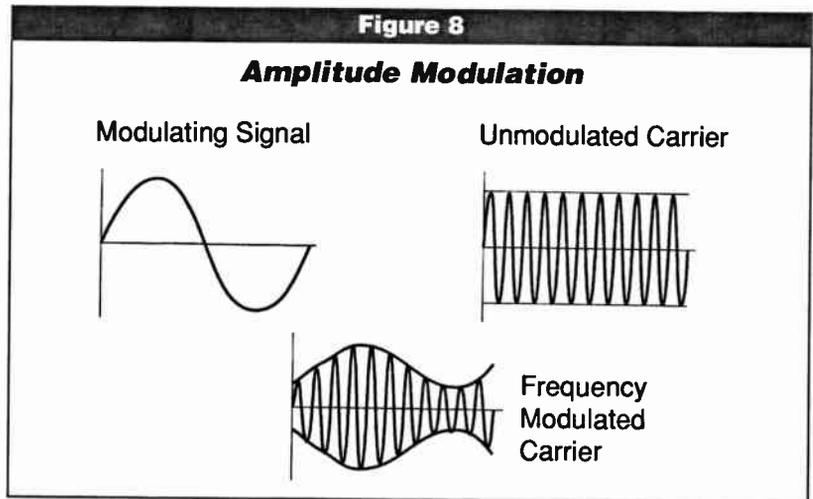
A feature used with telephone long-distance or Intra-LATA calling allowing the phone system to transmit calls over various network circuit lines in response to congestion and delays encountered on the primary circuit route.



Source: CED Magazine, April 1996

### AM - Amplitude Modulation

A basic property of analog electronic signals, such as in telephone voice communications, or analog radio frequency signals used in AM radio, AM is the height or amplitude of the signal. By electronically altering or modulating the amplitude of a signal, a carrier wave can be used to transmit the original signal either over-the-air or through a phone line. At the other end, the receiver recreates the original signal based on the amplitude changes that were made at the transmitting end.



Source: NAB

### AMAX

A certification mark placed on AM radios that meet specific high-quality standards established by the National Radio Systems Committee (NRSC). These standards were formulated to increase the reception quality of AM radio. In order to carry the AMAX certification mark, an AM radio must have an audio bandwidth of at least 50-7500 Hz, manual or automatic bandwidth control, and have expanded AM band capability (1605-1705 kHz). Additionally, if the radio is AM Stereo, the certification mark becomes AMAX Stereo.

### Ambient Noise

In the audio realm, this refers to general background noise that is always present in the atmosphere. Examples of ambient noise sources include the wind, humming fluorescent lights or power transformers, and electrical appliances or other equipment noises. Each of these natural or man-made sources produce some movement that displaces air causing variations in acoustic pressure and thus contributing a small amount of sound that make up so-called background noise. Accumulation of this "white noise" can affect signals transmitted using electromagnetic spectrum, such as AM and FM radio and television, causing signal interference. When noise sources are too distant or weak to be isolated they are considered ambient noise.

### AM Expanded Band

In a decision by the Federal Communications Commission, the FCC expanded the official allocation for AM radio licenses by opening up 10 new frequencies in the upper part of the AM band (1610 kHz - 1700 kHz). The ruling was to reduce troublesome interference to existing AM radio stations. In a March 1996 decision, 86 AM stations were designated to migrate to the so-called expanded portion of the AM band. Each of the new AM expanded band licensees will be authorized to operate with 10 kw of daytime and 1 kw of nighttime power.

### Ampere

The measurement of electrical current in a circuit, usually abbreviated as amps. Electric current moves electrons along by applying voltage. The rate of speed at which it is moving is measured in amps.

**Amplifier - Anonymous Remailer****Amplifier**

An electronic device for enhancing or amplifying the power of a signal. For example, as signals are transmitted through wireline networks such as telephone twisted-pair copper lines or coaxial cables, or even fiber optic lines, a certain amount of loss in signal power occurs. An amplifier is used to boost the signal power to make up for the loss and thus regenerating the signal. There is a limit as to how many amplifiers can be used in a cascade, as amplifiers are not capable of restoring seriously degenerated signals.

**Amplitude Shift Keying**

A simple form of signal modulation in which a carrier frequency is switched on or off to represent the presence or absence of a signal. ASK is only useful only in simplified transmissions going in a single direction (simplex mode), or at least in one single direction at a time (half-duplex). Other forms of shift key technologies are much more prevalent (Phase-Shift Keying) because signals are often divided into many channels and multiplexed using multiple frequencies. (See FDMA, PSK.)

**Analog**

In terms of electronics, analog is a traditional electronic process in which information such as audio and video signals, is represented as a continuous electronic wave. Using time-variant electrical characteristics in combination with specified electromagnetic spectrum frequency(ies) can represent the physical world of sight and sound. Analog signals typically have been used for transmitting voice and video communications (e.g., telephone voice calls, television video, radio/TV audio signals). In broadcasting, basic analog audio or video information is modulated by a carrier signal altering either the amplitude (AM) or frequency (FM) of the transmitted signal.

**ANI - Automatic Number Identification**

In video applications, ANI refers to a type of pay-per-view or near video-on-demand ordering system, in which a cable customer calls into an interface computer, located at the phone company to order specific PPV programming. Callers are automatically identified by telephone number, thus allowing the local cable system to authorize subscriber access to the programming event and initiate billing. The same or similar type of ANI operations may be used by the telcos themselves now that they also are getting into the video delivery business.

**Animated GIF**

A type of graphical image typically seen on Web pages that appears to be animated. The GIF file format allows for multiple frames of an image to be created and then cycled through, thus creating the animation effect. Animated GIFs are popular on the Web because the files are usually small and can be downloaded quickly. (See GIF, Vector Graphics)

**Anonymous FTP**

A generic password system to enable Internet users to access and download certain data files or programs that have been made available at a particular website. By setting up an anonymous FTP site, users can log into an area using the password "anonymous" or "guest" instead of their own name. (See FTP)

**Anonymous Remailer**

An Internet service that allows users to send email or post messages to a discussion group while remaining personally anonymous. This is accomplished by stripping all identifying information from the message and forwarding the message to its destination. For example, if users want to send anonymous email messages that are not traceable back to them, they would access an

anonymous remailer Website, type in the email address of their intended recipient and compose the message. When they click "Submit" or "Send" the anonymous remailer packages the email address and the message together and sends them to the destination, leaving out any identifying information about who sent the message and from where. (See E-mail, Newsgroups, Usenet)

### **Antenna Farm**

A centralized location for installing multiple satellite or broadcast antennas. In congested areas where satellite links as well as other communications connections are needed (e.g., microwave links), a centralized location is established. The location is usually isolated as much as possible to enhance signal receptivity, allow for easy maintenance and troubleshooting, and provide clear paths for transmission and reception. (See Teleport)

### **Antenna Gain**

A technical measurement of the power loss from a communication transmission antenna. Expressed in decibels, gain is a ratio of the amount of power required at the input of a theoretical loss-free reference antenna, and the actual amount of power required in order for a signal to have the same field strength at a specific distance in a specific direction.

### **Anti-Aliasing**

A technical process to smooth out distortions or aliasing effects created during the process of converting images to digital form. A picture on a computer screen is divided into a large number of very small blocks or squares called picture elements or pixels. With quick changes in color, brightness, or motion from one pixel to the next the rate of the digital sampling process is not sufficient to capture these changes. Aliasing effects result because the pixels at the point of a major color change can be erroneously assigned alternating adjacent colors. Normally, these effects show up as jagged edges and are smoothed out using an anti-aliasing technique such as by making the cutting-edge pixels gray in color to lessen the jagged appearance, or by making them a color that is an average of nearby pixels. (See Aliasing, Pixel)

### **Anti-Virus Software**

Software used to screen out, detect, and eradicate intentionally malicious computer programs known as viruses. Viruses typically are spread to home computers and the computer network systems of businesses and organizations through use of "infected" floppy disks, from corrupted files downloaded from the Internet, and/or hidden in electronic mail (E-mail) messages. By running an anti-virus program on a computer, the software constantly checks all new files for infections and warns the user if any suspicious files have been detected. All virus programs must be updated regularly in order to include information on the thousands of new computer viruses written and distributed each year. (See Virus.)

### **Apache Web Server**

Apache Web server was created by a group of computer programmers called the Apache Group in 1995. The founder of the Apache Group, Brian Behlendorf, was chief engineer for *HotWired* Internet magazine in 1994 and wanted to create a database of the magazine's readers. The system that he and his fellow programmers developed is now the most widely used Web server platform in the world, running on almost 60 percent of all Web servers (as of May 1999). Apache Web server runs on UNIX and Windows computers, and, unlike Web server options from Microsoft, it requires a thorough knowledge of programming to configure it and keep it running. The program was developed and is maintained by a loose coalition of programmers and is available free of charge. (See Open Source, UNIX, Web Server)

**APD - Application Sharing****APD - Avalanche Photodiode**

A lightwave fiber optic detector device that causes photons to cascade or avalanche thus generating a lightwave output significantly stronger than the original incoming signal. APDs are used in fiber optic networks to strengthen or amplify the laser lightwaves carrying communications signals over long distances.

**API - Application Program Interface**

A standard definition of an established set of functions and values that enable one computer program to communicate with another program, or with an underlying computer or networks operating system.

**Apogee**

The point in the elliptical orbit of a celestial body (e.g., planet, moon) or a man-launched satellite that is farthest from the gravitational center (e.g., star/sun, planet) around which it is orbiting. (See Elliptical Orbit, Perigee)

**Applet**

A term that refers to relatively small, compact computer software applications. Applets originally were Java-based computer programs which could be easily distributed over the Internet or other computer networks. This easy distribution is due to their relatively compact size and ability to be executed (opened) by a computer user regardless of the basic operating system on the computer. Other software developers are now producing applets, such as Microsoft's ActiveX products. Applets are commonly used in designing Web pages to produce multimedia effects, enhance Web page interactivity, or to deliver customized functions such as calendars, calculators or simple games. (See Java, ActiveX)

**Application**

In computer and multimedia business contexts, applications (often shortened to just "app" e.g., "killer app") are end-user software such as a word processing programs, spreadsheets, or a CD-ROM or video game authoring program. (See Killer App)

**Application Layer**

The seventh and highest layer of the Open Systems Interconnection (ISO) data communications model. (See OSI)

**Application Service Provider (ASP)**

ASPs have emerged because business customers are finding it more economical to lease or rent a specific computer program for period of time, rather than purchase an entire suite of software applications "off the shelf." Under the ASP model, customers usually contract to have the software they need hosted on an ASP's computer. A customer then pays a monthly fee to access the particular software through a Web browser over a leased telecommunications line. In most cases, client companies pay for the software lease license up front, and also agree to a multi-year maintenance contract to avoid having to contend with software upgrades or technical problems on their own computer systems. Most major technology providers, from Intel to MCI to Microsoft, are currently touting an ASP strategy.

**Application Sharing**

Refers to the feature of many videoconferencing systems that makes it possible for conference participants to simultaneously run the same application and see the activities on their own screens all at the same time. For example, any given participant in a videoconference could start up a

spreadsheet program and open a financial report that would be seen directly by all of those participating in the conference. (See Videoconferencing, Whiteboard)

### **Archie**

Archie servers were the primary means in the early 1990s to access and search the directories and files of anonymous FTP host computers. Users can still send requests to Archie servers with a telnet session using the appropriate user identification of “archie,” or by using an Archie “client” computer that has access to software designed to run with search capabilities, or by sending a request via email. However, by the year 2000 much of the usefulness of Archie servers had been supplanted by more general purpose Web servers and Web services. (See Gopher, Veronica, WAIS)

### **Architecture (Open/Closed)**

Apple Macintosh computers, which had historically refused to allow other manufacturers to make “clones” of their system, moved toward a more open system in the mid 1990s; however, the Macintosh clones have not succeeded in the market in large part because of Macintosh’s resurgence and push to innovate.

### **Archive**

Refers to the process of copying files for long-term storage or backup purposes. The archiving of digital files raises many important concerns. Companies and organizations that maintain digital archives must decide how long they are going to maintain the archive, how they are going to protect the information contained in the archive from hackers or catastrophic system failures, and how they are going access and use the archive in their day-to-day operation. (See Data Mining, Data Vaulting, Data Warehousing, Incremental Backup)

### **ARPANet – Advanced Research Projects Agency Network**

An acronym for the Advanced Research Projects Agency Network, which became the nucleus for the far-flung network of networks that is now the Internet. Developed in the 1960s and 1970s by the U.S Department of Defense as an experimental wide area network connecting together computer networks at research labs at university across the country. Security requirements for the network led to the development of a robust, decentralized, redundant network capable of functioning in a catastrophic environment. ARPANET merged with advancing technology evolving into the Internet and Web. (See Internet)

### **Array**

An organized arrangement of multiple items, devices, factors, etc. Arrays can be of digital bits, numbers or antennas such as on a broadcast tower, solar panels on a satellites, fibers in an optical fiber cable, or even on chessboard, which depicts a square array.

### **Artifacts**

In the video realm, these are undesired visual distortions caused by a range of natural interference or technical anomalies that are produced in a video image.

### **Artificial Intelligence – (See AI)**

### **ASCII – American Standard Code for Information Interchange**

A shared exchange computer code for alphanumerical text widely considered a basic format that can bridge incompatibilities between various software and computer operating languages. Because ASCII is the most common coding technique defining each of 256 possible characters in one byte, it is used for transferring text files on the Internet.

**ASIC - Asynchronous****ASIC - Application Specific Integrated Circuit**

A custom designed microchip intended to perform a very specific purpose. Industry development of ASICs is to focus on a microchip design to perform very specific tasks in order to speed up information processing without having to pay for capabilities that aren't really needed in a particular system.

**Aspect Ratio**

Refers to the basic ratio of the width of a rectangular object, such as a display screen, to the height. As such, the aspect ratio represents the proportional difference between width and height and is becoming commonly used in reference to television sets, TV or computer monitors, and various other video displays such as on laptops, hand-held PDAs, etc. The aspect ratio of a standard

NTSC television video screen is actually 12:9, but when reduced to its lowest common denominator form it becomes four by three or 4:3. Video systems such as those for digital high-definition television systems have a wider display aspect ratio of 16:9, which is much closer to those used for traditional 35mm theatrical films in theaters.

**Asymmetrical**

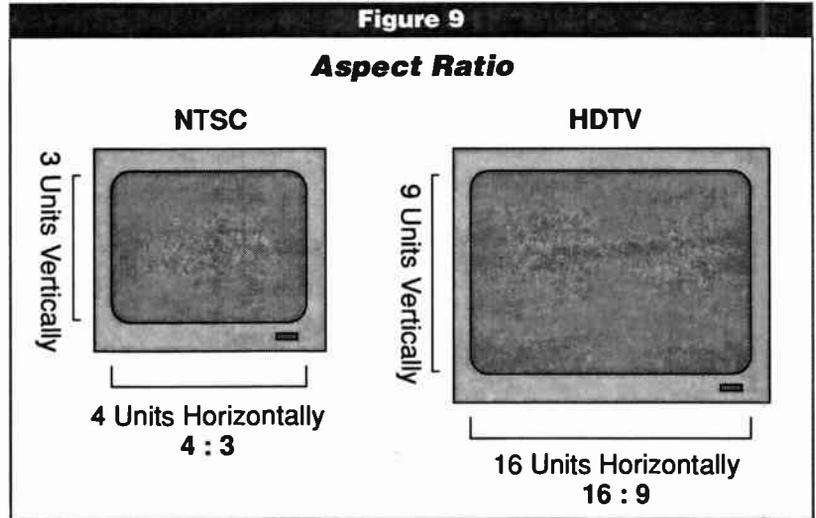
Essentially, this means not symmetrical or not having equal proportions. In communications systems it is used to refer to systems where information channels or transmission paths are not of equal size. For example, the downstream flow of information, data, or video signals require a much larger "pipeline" in terms of bandwidth than for upstream return signaling requirements. In some telecom networks, heavy traffic patterns are compensated by gatekeeping mechanisms dependent on timing such as letting a channel or line with the most traffic pass data for longer periods than another smaller traffic channel. In an asymmetrical ATM network some lines, channels or data are prioritized to be delivered before others. (See ATM)

**Asymmetrical Compression**

A digital signal compression technique in which the compression and decompression processes intentionally are not the same. Compression requires more processing power than decompression thus asymmetrical compression is often used in creating CD-ROMs where a longer period of time may be taken to produce the compress data, but the decompression mode must occur in real-time. This type of technique was prevalent before the advent of real-time MPEG-2 compression hardware and even MPEG-2 video was asymmetrical.

**Asynchronous**

Refers to a non-timing dependent communications protocol where both sender and receiver(s) don't have to be connected on-line for a message to be delivered. An example of this is e-mail



Source: NAB

where a user enters a message that's to be sent across a private or public network to a remote destination in a different time zone. When that person arrives at work, at any time in the day (because e-mail should always be checked daily as a common courtesy), that message will be waiting in the computer for the person to read. Also used to describe a method of communication using a series of bits, which carry their own timing information.

**ATM - Asynchronous Transfer Mode**

A high speed digital switching and transmission technology allowing voice, video, and data to be sent over a single wire or fiber optic line. ATM network information is divided into a series of fixed-length data packets called cells. Each cell is routed through the network at a constant data rate using header information contained in each cell. A cell path is established and then each individual node along the way uses this information to speed the cell on its way. As a result, delay or system latency is reduced drastically. ATM network speeds range from 25 million to 1 billion bps compared to analog phone lines transmitting, at most, at about 2 million bps.

**Attachment**

Commonly refers to a computer file that is "attached" to, or accompanies, an email message. Email programs that support attachments make it possible for users to send along and also view word processing documents, spreadsheets, graphics, images, sound files, and computer programs. Users should always be careful opening email attachments because the attachments might carry computer viruses. (See Email Attachment, MIME, Trojan Horse, Uuencode, Virus)

**Attenuation**

In communications, attenuation is the natural physical effect of degradation experienced by a signal as it travels through a medium. Adhering to the basic law of physics, when moving from an originating point through a medium, whether in the air or via copper or fiber lines, a signal encounters resistance from the physical medium resulting in a loss in signal strength. The amount of attenuation varies with the frequency of the signal and the medium used, and is often measured in units called decibels (dB) where the amount of loss is indicated as a negative such as -1 dB.

**Attenuator**

At times, a reduction in a communication signal is desirable for certain specified purposes. To accomplish this reduction, an attenuator device is used to artificially induce loss in signal power.

**ATV - Advanced Television**

Refers to the standard selected for digital television in the United States. ATV incorporates both Standard Definition Television (SDTV), which is equivalent to, or better than, conventional NTSC signals, and High Definition Television (HDTV) which is equivalent to 35mm film quality. One television channel can accommodate a single HDTV signal or multiple SDTV signals as well as some ancillary data services. (See SDTV, HDTV)

**ATVEF - Advanced Television Enhancement Forum**

A joint effort of broadcasters, cable companies, content companies and manufacturers.

**Auction**

The public sale of an item, or items, to the highest bidder. Attracting considerable attention of late, certain spectrum frequencies or RF bandwidth have been auctioned in open bidding. The Federal Communications Commission (FCC) already has auctioned licenses for new wireless services such as cellular and personal communication services (PCS). (See 700 MHz Auction)

Table 2

**FCC Spectrum Auctions**

<b>Communication Service</b>	<b>Spectrum Frequencies, Bands, Channels</b>	<b>Auction Number</b>	<b>Date Closed</b>
<b>Completed Auctions</b>			
Mobile Radio Service Phase II	220 MHz	# 18	Oct-98
Re-Auction	220 MHz	# 24	Jun-99
Broadcast	New CPs (FM, TV, LPTV)	# 25	Oct-99
Broadcast	Pahrump, NV - New FM CP	# 27	Oct-99
Cellular Telephone	Cellular (Unserved Areas)	# 12	Jan-97
Digital Audio Radio Service (Satellite)	SDARS - 2 Nationwide Lic. (S-Band)	# 15	Apr-97
Direct Broadcast Satellite	DBS (110° Orbital Slot - Ku-band)	# 08	Jan-96
	DBS (148° Orbital Slot - Ku-band)	# 09	Jan-96
Interactive Video Delivery Service	IVDS	# 02	Jul-94
Local Multipoint Distribution Service	LMDS	# 17	Mar-98
	LMDS	# 23	May-99
Location and Monitoring Services	L&MS -528 Licenses / 3 Paired Blocks	# 21	Mar-99
Multipoint/Multichannel Distribution Services	MDS	# 06	Mar-96
Wireless Paging	Paging 929 & 931 MHz	# 26	Mar-00
Personal Communications Service	PCS A & B Blocks	# 04	Mar-95
	PCS (Broadband) C Block	# 05	May-96
	PCS (Broadband) C Block Re-Auction	# 10	Jul-96
	PCS (Broadband) C, D, E, & F Blocks	# 22	Apr-99
	PCS Narrowband/ National	# 01	Jul-94
	PCS Narrowband / Regional	# 03	Nov-94
	PCS (Broadband) D, E & F Blocks	# 11	Jan-97
	VHF Public Coast Stations	VPC - (Ship-to-Shore) - 42 VHF Lic. (156-162 Mhz)	# 20
Specialized Mobile Radio Service	SMR 800 (896 -901 MHz )	# 16	Dec-97
	SMR 900 (935-940 MHz)	# 07	Apr-96
Wireless Communications Service	WCS A, B, C & D Blocks (2305-2350 MHz)	# 14	Apr-97
<b>Currently Scheduled</b>			<b>To Begin</b>
Broadcast	AM, FM, PST, SST	# 28	Mar-00
Unspecified: Fixed, Mobile, Broadcast Services	39 GHz A-N Blocks (U.S. Territories)	# 30	Apr-00
Unspecified: Fixed, Mobile, Broadcast Services	700MHz Band (formerly UHF Ch.62)	# 31	May-00
Unspecified: Fixed, Mobile Services	700 MHz Guard Band	# 33	Jun-00
Personal Communications Service	PCS (Broadband) Blocks C & F	# 35	Jul-00

continued

Table 2, continued

**FCC Spectrum Auctions, continued**

Communication Service	Spectrum Frequencies, Bands, Channels	Auction Number	Date Closed
<b>Not Yet Scheduled</b>			
Broadcast	AM Filing Window	# 32	NA
	Blanco, TX - New TV Station Ch.52	NA	NA
Specialized Mobile Radio	SMR 800 (Lower band)	NA	NA
Digital Electronic Messaging Service	DEMS - 24GHz Band	NA	NA
Wireless Comm. (unspecified)	4.9 GHz (50 MHz transferred from Government use)	NA	NA
Wireless Paging	Paging (Lower band)	NA	NA
Unspecified	218-219 MHz (formerly IVDS Ph 2)	# 13	NA
General Wireless Comm. Service	GWCS - A, B, C, D, E Blocks	# 19	NA

Source: FCC as of March 13, 2000; Contact: <[www.fcc.gov/wtb/auctions](http://www.fcc.gov/wtb/auctions)>

**Audible Tones**

In telephone communications, audible tone are those sounds within the range of human hearing that are used to indicate the status of a call connection; examples include ringing, busy signal, call waiting tone, and dial tone. In older systems, other subaudible tones may have been used for internal network functions, telemetry, or signal processing.

**Audit Trail**

A system used to document user access and uses of a computer system during a given period of time. An audit trail can be useful for making sure that only authorized users are accessing a secure system, or they can be used to piece together or recover a lost transaction. Most accounting systems and database management systems include audit trail functions.

**AUI - Attachment Unit Interface**

An interface standard that provides connectivity to an Ethernet transceiver.

**Authentication**

The process of verifying the identity of a person via an established process. For computer systems, often this process involves typing in a user name (or login) and a password which are compared against an established database of users that have authorized access to the system. If a user has been "authenticated" it means that they've been granted access to a particular system. In communication systems, an authentication process might verify that a specific message really came from its stated source. (See Login/Logon, Password)

**Authoring**

Authoring commonly refers to the creative process of utilizing computers, video equipment, scanners, and other electronic equipment or tools to create Website s, multimedia presentations, programs, clips, or graphics in digital formats. Most consumer grade computers, if equipped with the right authoring software tools, are capable of producing Web and multimedia content that can then be stored on hard drives, large removable drives (such as Jaz), burned onto CD-ROMs, and/or delivered via the Internet.

**Authoring Tools - Avatar****Authoring Tools**

Hardware equipment and software packages specifically designed to create or produce end-user multimedia products or software for business users or consumer markets. (See Authoring)

**Automatic Call Distributor (ACD)**

A specialized phone system designed to manage high-volume calling, both incoming and outgoing. Originally for incoming traffic (e.g., for customer service call centers) but the system increasingly is being used by call-generating firms (e.g., telemarketers). An ACD will recognize and answer an incoming call, search a database for instructions on how to handle the call, and send the call to a recorded prompt, or an appropriate service or telemarketer representative. For outgoing traffic, ACD systems can automatically dial numbers and transfer the call to an operator only if a human voice is detected when the call is answered. To defeat such telemarketing nuisance calls, many consumers purposely leave an answering machine connected to their home phone until they hear whomever is calling begins to leave a message, thus indicating a personal call not a ACD telemarketer.

**Autoresponder**

Similar to telephone answering machine for email, an autoresponder is a program on an email server system, which is designed to respond automatically to incoming email messages. Often an autoresponder is used to indicate that a person receiving an email is away from the office, or will not be available to answer email for a specified period of time. Autoresponders are sometimes used by businesses to deliver commercial messages to anyone who sends email to their specified address. (See E-mail)

**Autosave**

Many software applications have a built-in feature that will automatically save, at regular intervals, a document that is currently open and being worked on. Users who are concerned about losing their work because of a system crash or a power failure can use autosave to reduce the risk of losing large portions of unsaved work.

**AutoVision**

A technology designed to safely provide a type of "heads-up" video display for drivers of vehicles. Possible applications include the display of speed, warning lights, and remote control information. Currently, 30 states have laws prohibiting any type of video display in front of vehicle drivers, although auto manufactures are continuing R&D efforts to develop this new technology.

**AUX - Auxiliary**

A backup system or device that is put into use when a primary system fails or is unable to be accessed. An auxiliary system could be an alternate power source, such as another battery. In telephony, an auxiliary system could be voice mailboxes attached to the regular phone system. More generally, AUX refers to any type of secondary input to an electronic device.

**Avatar**

A graphical image or representation of a person, or of a specific character identity. Avatars often are used in a multi-user virtual reality environment. An avatar could be as simple as a color photograph of a cartoon character or a movie star. More complex avatars, commonly used in online games, are animated images that visually respond to computer commands. Many predict that computer-controlled avatars eventually will be used to represent individuals in Internet advertisements/commercial spaces, in online meeting places, and in a variety of other computer-based interactive environments. (See MUD)

**AVI – Audio Video Interleaved**

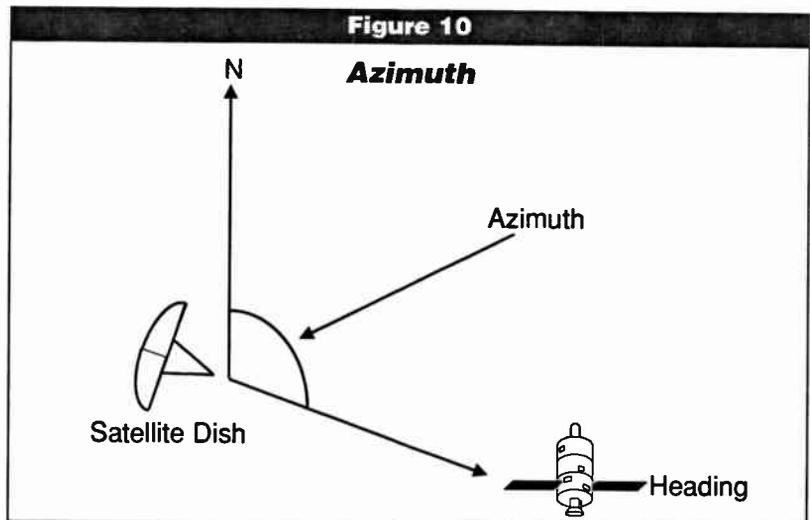
A transmission process of alternating audio and video digital samples created by Microsoft®. By interleaving the two signals, both arrive at a receiving point at relatively the same time, and maintain their necessary synchronization without use of special hardware. In different networks, protocols have been established to define the ratio of audio packets that need to travel at one time compared to video packets. Data packets usually have lower priority since text can basically arrive at any time without creating a distinct timing problem. In applications such as videoconferencing, the voice information needs to be “in sync” with the video information as closely as possible. Otherwise, delays would prove too disruptive to carry on interactive conversation.

**Axis**

- 1) A real or imaginary line on which an object, such as the earth, rotates.
- 2) The central core of a fiber optic line. (See Optical Fiber)

**Azimuth**

Expressed in terms of a compass heading, azimuth is a measure of the rotation of a selected point along the horizon with respect to true north. For users of satellite antennas, the position of a geostationary satellite can be determined using the azimuth in conjunction with the so-called “look angle” which is measured in degrees from the horizon up to the satellite.



Source: NAB

**B2B - Back Door****B****B2B**

A shorthand reference for the business-to-business market for the promotions, marketing, and selling of new communications services, computer hardware, software, network systems, or Internet commerce applications, among others. The B2B market is distinct in many ways from the commercial consumer market, with an increasing amount of attention being paid to this market sector due to higher return margins. (See E-Commerce)

**B-Channel - Bearer Channel**

A bearer channel is a fundamental component of ISDN telecommunication systems. B-Channels are able to transmit 64 kbps of digital information in both upstream and downstream directions; the channel can be circuit switched and is capable of carrying either voice or data signals. (See BRI, ISDN)

**B-ISDN - Broadband ISDN**

A high-speed digital service transmitted over a broadband network using an ISDN protocols. It is an evolving CCITT international standard for second-generation ISDN to be carried on fiber optical networks using digital packet switching to integrate and transport voice, data, text, fax images, one-way and two-way color video. An initial international bandwidth standard of capable of supporting 150 Mbps is called for, which can be multiplex or subdivided as required. In North America, B-ISDN initial capacity is set at a channel bandwidth greater than T-1 or 1.544 Mbps. (See ATM, ISDN)

**.bmp**

Used as a file extension name for bitmap data files containing digitized video or graphical information. (See Bitmap)

**Baby Bells**

Refers to the seven Regional Bell Operating Companies formed as a result of the divestiture of AT&T (i.e., Ma Bell) in 1984. (See RBOC)

**Back Channel**

Typically a narrowband link that takes advantage of unused bandwidth to send return signals from users back to a content provider. For example, at the same time that content providers are transmitting interactive television to their customers, users can connect through a back channel to a Website for additional information supplied from the original content provider or to an advertiser. A back channel can be used by customers to provide feedback, purchase goods and services, or access a wide variety of supplementary information. A simple type of back channel is the telephone modem connection from a PC to the Internet.

**Back Door**

A "hole" in a security system intentionally left there by the system designer. For example, programmers who design a computer security system might embed a special user name and password in the system that becomes a part of the security program. Because the design team knows this special user name and password, they could access a system running their security program through the "back door." While backdoors are sometimes intended to allow for convenient access to a system by those who build and maintain it, they also can be a liability enabling malicious hackers to gain access to information or disable computer systems.

**NAB**

**Backbone Network**

Refers to the major trunk line(s) in a telecom network or cable system. Backbone networks are the central or main support system of a network with capabilities for handling more traffic than smaller connected network branches or terminals. One example would be an Ethernet LAN with a maximum digital data transmitting capacity of 10 Mbps that's connected to an ATM backbone able to carry data at a maximum rate of 622 Mbps.

**Backlighting**

Refers to a display technology that is intended to make flat panel displays easier to read, especially on laptop computers. Backlighting produces an effect that makes the text and images on the screen appear brighter in contrast with the background. (See Flat Screen Displays, LCD)

**Backward-Compatibility**

Refers to the ability of any electronic system — consumer or professional equipment, software system, or software application — to operate in a compatible manner with an earlier generation(s) of the same technology to prevent immediate market obsolescence. Backward-compatibility is as much a policy issue as it is a consumer economics issue, particularly in areas where serious dislocations could occur as a result of major upgrading of television and radio broadcast or telecommunications systems from analog to new digital formats.

**Band**

In communications systems, the term band refers to radio frequency (RF) spectrum in a range between two defined limits. In addition to the fundamental electromagnetic frequency bands, other more narrowly defined frequency bands are designated with letter codes, and subsets of bands often are designated under international agreement by the ITU. The audible band or the range of frequencies that can be detected by the human hearing runs only between about 20 Hz to

20,000 Hz (20 kHz). Historically, blocks of frequencies have been allocated by the FCC for a specific service, and have come to be commonly known by their band name. For instance, the AM and FM bands for radio, VHF and UHF for television, or the C-band and Ku-band for certain satellite services. (See Frequency Allocation, ITU, Spectrum.)

**Band-Pass Filter**

A type of electronic filtering device used to screen out or allow certain spectrum frequencies to pass through to another part of a system. (See Filter)

**Table 3****Electromagnetic Frequency Bands**

Band Reference	Radio Electromagnetic Spectrum Frequency Hierarchy	RF Spectrum Limits
ELF	Extremely Low Frequency	Below 300 Hertz (Hz)
ILF	Infra Low Frequency	300 - 3,000 Hz
VLF	Very Low Frequency	3 - 30 kHz (kilohertz)
LF	Low Frequency	30 - 300 kHz
MF	Medium Frequency	300 - 3,000 kHz
HF	High Frequency	3 - 30 MHz (megahertz)
VHF	Very High Frequency	30 - 300 MHz
UHF	Ultra High Frequency	300 - 3,000 MHz
SHF	Super High Frequency	3 - 30 GHz (gigahertz)
EHF	Extremely High Frequency	30 - 300 GHz
THF	Tremendously High Frequency	300 - 3,000 GHz

## Bandwidth

### Bandwidth

Bandwidth in the digital domain refers to how much digital data can be transferred over a given wired or wireless communications "pipeline" within a given span of time. Bandwidth capacity is typically measured in digital bits per second (bps) and applies to bandwidth transmission capacity also referred to as the data rate of a particular RF transmission, wired phone line, cable, satellite, fiber-optic, computer bus or network interface system. A larger amount of bandwidth is needed to transmit at a faster rate and/or to transmit more

**Table 4**

### Bandwidth

Wireline System/ Service	Data Rate
Ethernet	10 Mbps
Fast Ethernet	100 Mbps
Gigabit Ethernet	1000 Mbps
Token Ring	4.0, 16.0 Mbps
Fast Token Ring	100, 128 Mbps
FDDI	100 Mbps
ADSL	1.5 - 9.0 Mbps
T1	1.5 Mbps
T3	44.7 Mbps
Dial-up via modem	9.6, 14.4, 28.8, 33.6, 56 kbps
ISDN	1.544 Mbps
DS-O	64 kbps
Frame Relay	56 kbps - 45 Mbps
SMDS	45.0, 155.0 Mbps
ATM	25, 45, 155, 622 Mbps, 2.488 Gbps
Cable Modem	27 Mbps

Source: Industry

**Table 5**

### Examples of Digital Video Data Rates

Transmitted Signal	Digital Data Rate	Notes
NTSC Video	90 Mbps	Uncompressed
NTSC Video	45 Mbps	Compressed - Telco DS3 (Video) Standard
HDTV - DBS	30 Mbps	Compressed
HDTV - Terrestrial	20-24 Mbps	Compressed
DBS	3-10 Mbps	VCR-quality to NTSC-quality
Satellite Business Television	3-10 Mbps	Rate depends on desired picture quality, degree of motion
Satellite Videoconferencing	56 kbps 2.4 Mbps	Rate depends on desired picture quality, degree of motion
ADSL - Telco Video	3-4 Mbps	Projected high-end rate for compressed NTSC video over telco copper loops
Videophones	20 kbps	Projected Eventual Rate

Source: NAB

complex digital data to assure high quality, real-time delivery. Audio, video, datacasting and Webcasting services require more bandwidth due to the complexity and high degree of changes involved in these signals compared to ordinary text or phone communications. The larger amount of the bandwidth available, the greater the quality and transmission speed capacity of a voice, video or data link.

### Banner Ad

In electronic commerce a banner ad refers to an advertisement prominently located at the top of an Internet website. Banner ads typically are prominently displayed in a rectangular box at the top of a Web page providing information (paid client ad, “in-kind” advertisement, or in-house promotion.). To gain viewer “eyeball” attention, banner ads usually are designed with bright colors, animation graphics and “hot spots” for linking directly to another website. (See Ad Banner, Ad View, Hot Spots)

**Figure 11**

**Examples of Banner and Side Bar Ads**

The screenshot shows a portion of the WSJ.com website. At the top, there is a navigation bar with 'FRONT SECTION', 'NEWS', and 'SEARCH' buttons. Below this is a banner advertisement for Tribune Co. with the headline 'Tribune Co. Deal Puts Regulatory Ban On Cross-Ownership in the Cross Hairs' by John R. Wilke. To the right of the main article is a side bar containing several smaller advertisements: 'Voices Event' with a discussion on IPOs, 'Business Fare' for Northwest cell phones, and a 'SPECIAL OFFER' for a 'FREE Daily Personalized E-Mail' subscription. The source is cited as 'Source: interactive.wsj.com'.

### Baseband

Refers to a basic set of frequencies of an RF signal prior to any modulation; essentially, an unmodulated signal. For example, the signal output from a television camera contains baseband information representing color frequencies for each line. A baseband network is limited to a single unmodulated signal, although it can be fairly complex. An example is a typical Local Area Network (LAN).

### BASIC - Beginners All-purpose Symbolic Instruction Code

A relatively simple programming language created in 1963 which is often used to write software. BASIC was the primary computer programming language for many years, and while it is still in use, more commonly used software languages today include C++ and Java. (See C++, Java)

### Basic Trading Area (BTA)

Refers to the geographic boundaries that segment the country for licensing purposes. Based on *Rand McNally's Commercial Atlas & Marketing Guide*, BTA boundaries follow county lines and usually include the county or counties whose residents make the majority of their shopping purchases in the area. The FCC has used BTAs to license a number of services, including broadband and narrowband Personal Communication Services. (See Major Trading Area)

**Batch File - Benchmark****Batch File**

A computer file which provides step-by-step instructions to the system's CPU. (See CPU)

**Baud Rate**

Baud rate is the speed at which digital signal information is transmitted over an analog line such as a phone line. The baud rate is the number of changes made to the analog sine wave per second. Analog baud rates are not to be equated with data rates, which reflect the amount of digital bits of information, transmitted per second. Computer signals transmitted over analog phone lines require use of an analog modem to first convert the digital computer signal into a continuous analog signal for transmission.

**BBS - Bulletin Board Service**

Computerized on-line locations used as designated forums or informal meeting places for exchanges of information, announcements, discussions, uploading/download of files, etc. BBS sites do not require users being connected simultaneously but store exchanged information for later accessing/retrieval.

**BCC - Blind Carbon Copy**

An email option used when an individual wishes to send an email message to another person without that person's email address appearing in the header of the message. This makes it possible to send a message to many different people without any of them knowing who else may have received the message. (See E-mail, Header)

**BCD - Binary Coded Decimal**

A standardized computer process for converting decimal numbers to binary numbers.

**Beam Splitter**

Relates to fiber optic transmissions where a lightwave can be split into two or more separate beams allowing the original signal to be transmitted to more than one receiver.

**Belcore - Bell Communications Research**

Technical laboratory and R&D facility formed at the time of the 1984 divestiture of AT&T into seven Regional Bell Operation Companies. Originally, jointly owned by RBOCs, Belcore provided centralized research and other technical R&D functions to its client-owners. Passage of telecommunication reform in 1996 enabling the RBOCs to compete more aggressively with each other prompted the privatization and the sale of the facility.

**Bell Laboratories**

The highly regarded technical research arm of AT&T, which was permitted to be retained by AT&T after divestiture in 1984. AT&T split into three separate companies in 1996, with Bell Labs joining AT&T's manufacturing divisions to form Lucent Technologies.

**Benchmark**

Refers to a standard program or set of programs that can be run on different computers to give an accurate measure of their performance and computing power. A benchmark may attempt to indicate the overall power of a system by including a "typical" mixture of programs; or it may attempt to measure more specific aspects of performance, such as how quickly graphics can be display, how fast certain types of mathematical computations can be performed, etc. While there is no single benchmark that can fully characterize computer system performance, many computer trade magazines have developed their own benchmark tests, which they use when reviewing computer of products.

**BER – Bit Error Rate**

The rate or percentage of bits received in a digital transmission that are in error when compared to the total number of bits transmitted. A low or high BER is a measure of the absolute quality of a particular digital transmission line or pathway. For an acceptable grade of digital service the amount of incorrect bits must not be above a defined level usually expressed in terms of the number of bit errors per million ( $10^{-6}$ ).

**Betacam SP**

Standard professional-quality half-inch videotape developed by Sony which is a higher quality than the consumer version of Betacam; either system considered of higher technical quality than VHS videotape.

**Beta Test**

Refers to a testing phase by a panel of users for products in development or being refined (e.g., software packages or new electronics equipment) prior to final market release. Product versions often are relatively complete when submitted for beta testing, but the hands-on rigors of real users often reveal design flaws or glitches not envisioned, thus additional refinements can be made to improve final product quality.

**Bezel**

In computer lexicon, the bezel is the metal or plastic framing surrounding a cathode ray tube (CRT) computer monitor.

**Binary**

The language of computers where all information is converted into binary form (i.e., using only two digits) of ones and zeros. Binary code was adopted for computers because using ones or zeros best represented the two fundamental conditions of an electronic circuit, which is either “on”, or “off.” By stringing together series of zeros and ones programmers can write programs to control computer functions, write sets of instructions to perform tasks, or represent information of any kind in digital form for processing, manipulation, or transmission from one computer or digital system to another. (See Bit)

**Binary Numbering**

*(See Table 6 on the next page)* In one single bit the value of the bit can be either 0 or 1, thus there are only two possible values. The numbering system with only two possible values is called a binary system and is the basis for all digital computer coding. The following table shows the maximum numeric combinations in a binary code structure with all bits set to zero equivalent to one combination. Just as 99 is the largest two digit number in the decimal numbering system, the largest number in a two digit or binary coding system is 11 (one, one; not eleven.) The decimal equivalent of the largest binary number in a group of bits is one less than the total number of values. For example, in four bits with two binary numbers possible for each bit, there are 16 possible values. In base 10 or decimal system, the largest binary number is 1111 or 15 in decimal.

**BINHEX – BINary HEXidecimal**

A method of converting non-text files into ASCII code primarily used with Apple Macintosh systems before sending files via electronic mail or the Internet.

**BIOS (Basic Input/Output System)**

Part of the system software of an IBM-compatible personal computer that installs the operating system and subsequently controls the initial start-up (or “boot”) process for active use of the

## Bird - Bit Density

system. For example, when a user turns on the power to an IBM-compatible computer, the first thing that is displayed is a series of text lines scrolled by contain information such as "Generic BIOS, Version AAO5, Copyright 1992-99," among various other system information. (See Boot or Boot-up, Firmware)

### Bird

Commonly used slang for a communication satellite. (See Satellite)

### Bird Time

Slang referring to the period(s) of time leased on a satellite for specific use. Incorporated in this leased time is usually a thirty-minute set-up and testing period, which is added to the rental cost.

### Bit

A contraction of Binary Digit. A bit is a mathematical method to represent a binary system of numbering, having two mutually exclusive states, such as on/off, black/white or up/down. Due to its simplicity, electronic computers are designed to use binary coding for handling electronic signals. When digitizing analog signal information into digital code, such as video signals, the visual characteristics such as brightness and color are all represented by in binary code of zeros and ones. Digital bits subsequently are combined into groups of eight to form a byte. In digitizing pictures or images, degrees of relative brightness can be determined and encoded into eight bits. An 8-bit code represents one of 256 unique shades of gray measured on a standardized scale for brightness (luminance) that extends from absolute black to absolute white. Information on luminance is just one of the basic elements needed to be determined for every pixel in a video display frame. Another basic video element of color, or chrominance, also needs to be represented. The more shades of color used in a video display, the more specific codes for chrominance need to be available when converting visual material (film, video programming, or images) into picture elements or pixels for display. (See Chrominance, Luminance, Pixel)

### Bit Density

The number of bits in a given image area or other digitized material. As technology improves the ability to detect smaller changes faster, bit density allows the storage locations on magnetic disks or tapes to be closer together.

Table 6

### 16-Bit Binary Code and Decimal Equivalents

# of Bits	Largest Binary Number Total Possible Values	Decimal Equivalent	Binary Number
1	2	1	1
2	4	3	11
3	8	7	111
4	16	15	1111
5	32	31	1 1111
6	64	63	11 1111
7	128	127	111 1111
8	256	255	1111 1111
9	512	511	1 1111 1111
10	(1K) 1,024	1,023	11 1111 1111
11	(2K) 2,048	2,047	111 1111 1111
12	(4K) 4,096	4,095	1111 1111 1111
13	(8K) 8,192	8,191	1 1111 1111 1111
14	(16K) 16,384	16,383	11 1111 1111 1111
15	(32K) 32,768	32,767	111 1111 1111 1111
16	(64K) 65,536	65,535	1111 1111 1111 1111

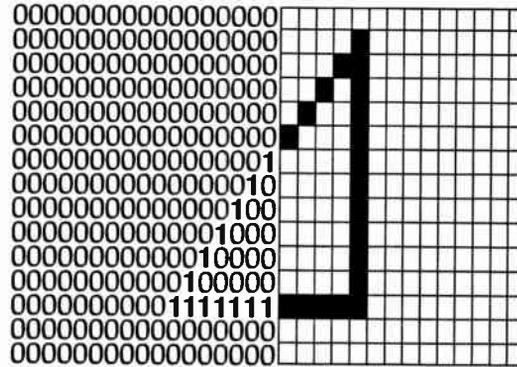
**Bitmap**

A grid of pixels with one digital bit per pixel used to represent pictures, graphical data or alphanumeric characters on a computer or other digital display device. Some software programs use .bmp as the so-called extension to a file name indicating when an image has been digitized for computer use for example in a corporate presentation. Bitmap files are electronic representations of an original photographic picture or other graphical element.

Figure 12

**Monochrome Bitmap Example**

*Images that are scanned into the computer are turned into bitmaps*



Shows the bits  
in the bitmap

Depicts what would  
show on screen

Source: Techweb.com; Computer Desktop Encyclopedia

**BITNET - Because It's Time Network**

An electronic network allowing CERN members to share information with each other to support research education. (See CERN in Appendix)

**Bit Stream Transmission**

Refers to the transmission of a series of digital bits in a continuous stream where there are no gaps or pauses between the individual bits. Digital bit stream transmissions are sent at fixed time intervals and constant speed with the same number of bits sent at each designated time interval. Because of these fixed periods, less overhead is needed in the network for synchronization of the receiving site.

**Black Box**

A generic slang term referring to electronic devices performing complex functions usually too complicated to explain easily. Examples include encoders, decoders, A/D or D/A converters, set-top boxes, etc.

**Black Burst**

Also called "True Black," a black burst is a video signal generated and recorded onto a videotape for the purpose of inserting new edited material and referred to as insert editing. When recording black burst, synchronizing pulses are recorded at the end of each frame, thereby creating an uninterrupted set of timing signals on the tape. These signals are used as reference points called a control track for an editing unit and are needed because a break in the consistency of the pulses causes a tape to lose synchronization. The process is used so that a segment of video can be placed at any point on the "blacked" tape by locking onto these pulses. Without the pulses, this procedure is not possible. Black burst is also called "blacking," "laying black," or "boning," and is considered black because the coded brightness of +7.5 IRE on the luminance scale is the standard video signal that is inserted onto videotapes between pulses. (See Video Signal)

**Blanking Intervals - Board****Blanking Intervals**

Refers to portions of the NTSC television broadcast signal and includes horizontal blanking (HBI) and vertical blanking intervals (VBI). (See HBI, VBI)

**Bloatware**

A derogatory term used in the computer industry to describe software programs that are increasing in code size and thus take up more and more disk space as new features are added. But in practical terms, such bloated software does not add proportional advantages either to the utility of the program or to its ease of use. Bigger is not necessarily better.

**Block**

A block is a segment of digital data information that is treated as a single unit. A part of each block or segment is header or parity information that assists in directing the data through a network, or acts as an error check in transmissions. Depending upon the type of network, blocks can be of fixed or variable size and also may be referred to as a packet.

**Bluetooth**

Named for a Viking king who unified Denmark, Bluetooth is a technical protocol in development that ostensibly will unify all the diverse segments of the wireless communications world. The aim is to forever banish the mass of spaghetti-like cable cords that run from the back of most computers to connect with peripheral and related appliances. In a Bluetooth-enabled world, computer devices would use RF (radio frequency) signals transmitted in the currently vacant 2.4 GHz frequency band. The RF signals will recognize and be able to seamlessly communicate with each other, even if the transceivers are not in line-of-sight with each other. Swedish mobile-phone maker LM Ericsson initiated the Bluetooth Special Interest Group in 1998 along with IBM, Intel, Nokia and Toshiba. The objective was to develop a single specification standard that would allow low-cost, short-range wireless communication and network signaling among PCs, mobile phones, digital cameras and other digital devices. In addition, Bluetooth would enable connections to the Internet and thus cut through the fast growing forest of wireless data transfer protocols. Ideally, mobile computer vendors could then build a single radio transceiver into all digital devices enabling them to "speak" in one, single language with each other. This effectively and elegantly would eliminate the need to create computers capable of handling all manners of interface cards for various plug-ins and add-on devices or services. The backers of a Bluetooth world admit there still remains some engineering homework to do, and that capital costs must come down. The cell phone market is viewed as a leading engine that will drive acceptance of Bluetooth worldwide. (See Handheld, Internet Appliance, Palm-top Computing)

**BNC Connector**

A type of electronic cabling connector used in both video and data communications that connects equipment with coaxial cable. A coaxial cable can have different kinds of physical connectors attached to it. A BNC connector is differentiated by its bayonet styling from the more common f-connectors, which are used to connect television sets to a cable system.

**Board**

Shorthand reference to computer boards or electronic circuit boards, also called a card, which contains electronic components and the printed IC chip circuitry. Boards contain the necessary wiring for connecting them to other boards or to a bus system for interconnection to other electronic processors. Some boards or cards are permanently mounted while others are installed

by plugging them into designated slots in a PC processor. Boards are designed to manage computer processors or other communication system devices, functions or peripheral equipment. Cards or boards allow relatively easy modification, repair or replacement and thus are a common component on most PC systems.

### **Bookmarks/Favorites**

A Web browser feature enabling users to store a personal list of favorite website addresses for future reference and easy access. "Bookmarks" (on Netscape Navigator) or "favorites" (on Internet Explorer) offer easy one-click access to a chosen site by displaying a drop-down list, menu or special Web page containing the stored links. (See Browser)

### **Boolean Search**

The term "Boolean" is descriptive and refers to the 19<sup>th</sup>-century English mathematician George Boole who is best known for his contributions to symbolic logic. A Boolean search is a logic-based technique for searching a set of information data (database) using the Boolean-designated operators of: "AND," "OR," and "NOT." Along with the use of parentheses, these operators can be used to define relatively complex data criteria designed out of these simpler search terms or commands. While Boolean search operators have been important tools in seeking out specific information on the Internet in the past, with the creation and increasing use of Web search engines and directories, it is now more common for typical users to get the results they want with simple keyword searches. (See Search Engine)

### **Boot or Boot-Up**

Computer slang for the start-up process a computer goes through when loading a program or system. Booting up most commonly takes place when a computer is first switched on or started. (See Reboot)

### **BOS - Broadband On-Screen**

A technique allowing more than one video channel at a time to be viewed on a screen. An example of this technology is used in consumer television sets with the picture in a picture effect where more than one channel is capable of being viewed simultaneously. (See Broadband)

### **Bot**

An abbreviation for "robot," the term refers to a type of computer software application designed specifically to automatically run or manage specific computing tasks not requiring direct human intervention. For example, bots (also known as Knowbots, Softbots, Webcrawlers among other terms) are used on computer networks to monitor system security, or can be launched by Internet users via a search engine to compile indexed lists of websites or pages on a specific subject. "Chatbot" programs are a variation and enable a computer to interact with people in "chat rooms." (See Agent, AI, Expert System, Spider)

### **Bottleneck**

In communications, like in other real life situations, bottlenecks occurs when too much traffic tries to get through the same narrow space at the same time. When more data is being transmitted through a network in which one or more components of the network cannot adequately handle, a backlog of data accumulates at that point. When data jam-up occurs, they can grow quickly and information is either lost or by necessity is just re-routed back to the originating point.

**bps - Broadband****bps - Bits Per Second**

Expresses the rate at which digital bits are transmitted. Common speeds or data rates for digital networks range in kilobits/second (kbps) and megabits/second (Mbps), but more advanced broadband fiber and satellite systems are expected to be capable of gigabits per second (Gbps) transmission rates. For clarification, a typical confusion relates to transmission data rate capacity versus computer disk memory or other types of digital storage capacity. Information stored in memory is expressed in bytes, meaning it is already divided into 8 bits. Transmission data rates are expressed in bits — not bytes — per second.

**BPSK - Binary Phase-Shift Keying**

A variation of the digital modulation method of Phase-Shift Keying. (See PSK)

**BRI - Basic Rate Interface**

Refers to a level or grade of ISDN telecommunication service that uses two bearer (B) channels and one data (D) channel. Often denoted as 2B+D, BRI has two 64 kbps channels that are used for video or audio information transmission, and one 16 kbps channel devoted to internal signaling, maintenance, and call status information. This level of ISDN service is also referred to as "basic access." (See B-Channel, ISDN)

**Bridge**

Similar to its physical world meaning, in communications a bridge is an electronic device to move data traffic from one segment of a (similar or different) physical network to another. Bridges are used to connect multiple Local Area Networks together enabling the sharing and/or transfer of communication data among them.

**Bridge Amplifier**

A type of cable TV amplifier that taps a signal from the main cable trunk line, amplifies the signal and transmits the boosted signal further along to one or more feeder lines.

**Brightness**

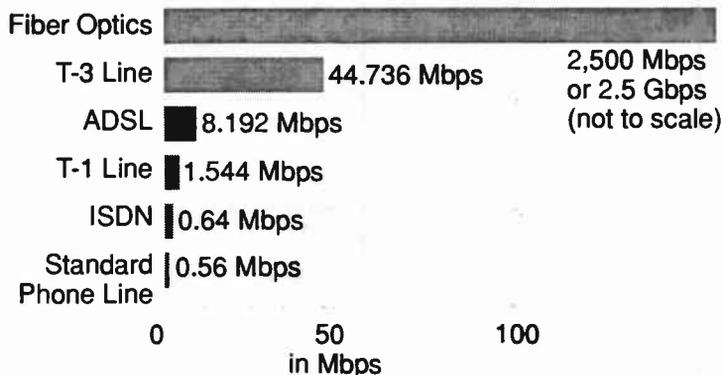
In the video realm, the degree of brightness is the luminance of a video signal. (See Luminance)

**Broadband**

There are numerous definitions of broadband; some are fairly technical while others are in the realm of common usage. Broadband systems are integrated communications networks in which

**Table 7****Digital Hierarchy**

Kilobit	=	1 Thousand bits
Megabit	=	1 Million bits
Gigabit	=	1 Billion bits
Terabit	=	1 Trillion bits
Petabit	=	1 Quadrillion bits

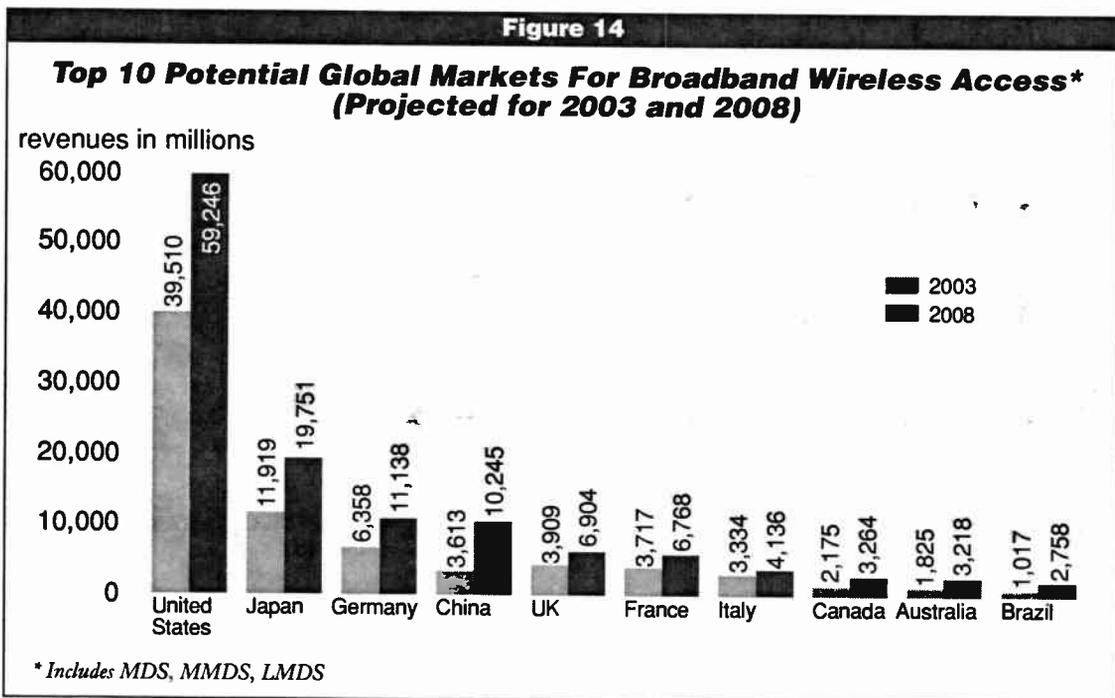
**Figure 13****Comparative Wireline Data Rates**

Source: Bellcore

the equipment and transmission network bandwidth capacities are relative high in comparison to other network systems. Broadband systems typically are used for transmitting multichannel video, along with other data, text, or information services. Broadband does not necessarily mean a terrestrial wireline, cable, or fiber optic system. RF-based broadcast television and satellite systems are broadband services with very high bandwidth capacities compared to most other services. Also, broadband does not necessarily connote a digital system, although certainly this is much more the case today than in the past. Fiber-optic and upgraded coaxial cable systems are typical broadband systems where numerous video channels and future telephony and data services can be supported simultaneously. Technically, some consider systems with a transmitting capacity above 4 kHz voice-grade (narrowband) channels as a broadband system. Others set a bandwidth limit of 20 kHz to be considered broadband, although a growing segment of engineers consider any service exceeding the telephone industry's T-1 line standard of 1.544 Mbps as defining a broadband system. Consequently, systems with rates between 20 kHz and 1.544 Mbps are defined as wideband, and systems with less capacity are narrowband systems. (See Bandwidth)

**Broadband Wireless Access**

Refers to broadband wireless fixed systems as distinct from wireless mobile services. Formerly providers such as MMDS and LMDS were referred to as the wireless cable industry. Technical capabilities and new high-bandwidth capabilities have enlarged the scope and competitive business advantages of these operations. Broadband wireless systems (MMDS and LMDS) are relatively short-range (25 miles) fixed point-to-multipoint services. Construction and operations are very cost-effective for delivering competitive multichannel video services creating growing demand for system worldwide particularly in areas that do not have other multichannel providers such as cable or satellite DTH services. New digital MMDS systems are being built around the globe. The fixed broadband platform has major advantages in the race to first-to-market for high bandwidth applications including Internet access, e-commerce, competitive telephony, data as well as multichannel video. (See LMDS, MMDS, Wireless Broadband Fixed Access)



Source: The Strategis Group, inc; courtesy of Wireless Communication Association International (WCAI); contact [www.wcai.com](http://www.wcai.com)

**Broadcast - Bundling****Broadcast**

Broadcast or broadcasting basically is the distribution of RF communications signals in a point-to-multipoint transmission mode. The term is most often associated with television and radio broadcasting. However, there are other instances of "broadcast" transmission modes in Local Area Networks (LANs), datacasting businesses, or broadcast fax systems. In each case, the concept is the same, which is to reach multiple viewers or users simultaneously from a single transmission source.

**Broadcast PC**

In the future, it is expected that a standard PC will have some type of digital broadcast receiver connected to it, or embedded within it. Such receiver equipment will enable the PC to receive datacasting or data broadcasting services transmitted in conjunction with broadcast radio or video signals. It is anticipated that there will be growing utility for computers with built-in or external peripheral broadcast receivers for reception of an expanding range of new applications including interactive TV functions or electronic couponing. (See Datacasting)

**Broadcast Quality**

Refers to the relatively high quality or grade of signals commonly used in commercial television broadcasting operations. Video signal quality can vary due to a range of factors, but there are certain quality requirements that must be met in order to be considered a broadcast-quality video service.

**Brouter**

A combination of a bridge and a router. (See Bridge, Router)

**Browser**

Browsers provide a graphical user interface (GUI) that is used to access, look at and navigate through Internet content, especially Web content. The two most common browsers are Internet Explorer and Netscape Navigator. (See GUI, Mosaic, Netscape)

**BSS - Broadcast Satellite Service**

An internationally designated class of satellite service for the transmission of video programming. BSS services traditionally were transmitted on domestic fixed satellites having low to mid-power capabilities and operating in C-band and Ku-band frequencies. (See C-Band, Ku-Band, Spectrum Allocations)

**Buffer**

Temporary storage capacity used by digital computer and communication systems to assist data flow transactions, or system or network operations. In a voice or data network, a buffer stores overflow information until it can be accessed for further processing. Buffers are used in computers, on major nodes in a network, and in most devices connected to a network.

**Bundle**

A physical grouping of optical fibers, electrical wires, coaxial cables or other lines combined into a common sheath to increase efficiency in network construction. Components in bundles are often identified by different wire colors.

**Bundling**

Refers often to the combining of various types or levels of communications services into attractive, cost-efficient packages, which are marketed to business customers or consumers by telephone, cable, or other network providers of telephony, data, video, or other information services.

**Burst**

A sequence of connected information that is transmitted together over a medium. (See Bursty Data, Color Burst)

**Bursty Data**

Term used to characterize data transmissions that are not typically continuous in form, but rather are broken up in non-continuous bursts so that only part of a network's bandwidth capacity is being used at any time. Such data transmissions make inefficient use of a network; thus much effort has been made to design network protocols to alleviate the inefficiency by filling in the gaps between active digital information with other transmitted data.

**Bus**

Parallel electronic circuits acting as connecting pathways for data transfers within a computer. Higher numbers of bus circuits in a system mean more bits can be sent simultaneously where the number of parallel lines connecting any two devices within a com-

puter equals the maximum amount of bits that can be transferred per clock cycle. Most computers have bus architectures allowing data transfer rates of 8, 16, 32, 64, or 128 bits. All internal components are connected via one or more bus systems, but not all computer segments require the same capacity for expansion buses (buses located on the I/O modules of a computer system). Standard bus architectures vary for each I/O module depending upon the purpose for which that module is dedicated. For example, the VL bus, developed by the Video Electronics Standards Association (VESA), is twenty times faster than the more common ISA bus. Both buses, however, could be used within the same computer. (See I/O)

**Bypass Networks/Bypass Services**

Essentially, private networks being built by competitive telecommunications companies that bypass or avoid having to use any part of a local telephone company network. Primary business reasons for customers seeking out alternative service providers (ALTs) and their bypass networks are cost-savings, telco bandwidth limitations, quality-of-service, data/signal security, and greatly reduced set-up time.

**Byte**

Combining eight digital bits in a single group, which are processed as a single unit. (See Binary, Bit, Word)

Table 8

**Standard External Bus Architectures**

Type	Group	Bus Version
ISA	IBM	8-bit; 16-bit
EISA	Industry	32-bit
MCA	IBM	32-bit
VL	VESA	32-bit
PCI	Intel	64-bit

Source: Industry

**C - C/N****C**

A programming language that is not as user-friendly as BASIC but much easier to use than binary commands. Designed to reduce software development time, C uses some symbols instead of requiring written programming commands and is now one of the most popular software development languages.

**C++**

An extension of the "C" programming language combining features of the original and other programming languages. C++ emphasizes the use of small sequences of commands called objects, which are reused to save development time.

**C7**

The European standard equivalent of the North American telephony switching system, SS7. C7 is not completely compatible with SS7 thus international gateway switches need to convert the signaling between the two systems in real time prior to domestic distribution on the respective network system. (See SS7.)

**C-Band**

A segment or portion of the electromagnetic spectrum that has been allocated on a shared basis for satellite and terrestrial microwave transmissions. C-band spectrum extends from 3.4 GHz to 6.4 GHz. C-band satellite transmissions require use of large transmitting antennas to uplink signals to satellites in geosynchronous orbit and relatively large receiving antennas (3 -5 feet) often referred to as television receive-only (TVRO) antennas. Use of TVROs began in the 1980s to receive satellite-delivered cable programming creating the so-called "backyard antenna" or TVRO market. (See Clarke Belt, Geostationary, Spectrum Frequency)

**Table 9****Frequency Bands - Letter Designations**

Letter Band	Designated Frequencies
C-Band	4 GHz - 8 GHz
K-Band	18 GHz - 27 GHz
Ka-Band	27 GHz - 40 GHz
Ku-Band	12 GHz - 18 GHz
L-Band	1 GHz - 2 GHz
Q-Band	20 GHz - 46 GHz
S-Band	2 GHz - 4 GHz
V-Band	40 GHz - 75 GHz
W-Band	75 GHz - 110 GHz
X-Band	8 GHz - 12 GHz

Source: IEEE Standard Letter Designations, IEEE Std. 521, 1984 reaffirmed 1989

**C/I - Carrier-to-Interference Ratio**

A more specific term describing the ratio between the signal strength of the carrier and a particular type of noise. Interference can occur throughout a communication transmission and is identified generally as coming from three defined areas (i.e., the source, the channel, and/or the receiver). Interference differs from noise in the respect that it comes from some specific, although often unidentified, particular source.

**C/N - Carrier-to-Noise Ratio**

A commonly used technical way to express the amount of disturbance or "noise" that is present in a signal. All communications systems have noise. The lowest level of noise in a signal channel or line is background noise due to vibration of atoms. The relationship of signal to noise is repre-

sented as a ratio of the measured strength of a carrier signal to the amount of "noise" present in an RF channel or wireline link. Noise is considered any disturbance or undesirable energy that negatively affects, impinges upon, or alters the signal. If the amount of noise (i.e., the combined strength of all noise sources) is greater than the power of the signal, then the original signal becomes unrecognizable for most communication systems. Devising techniques to eliminate, reduce, mask, or even innovatively re-use the energy in noise are on-going efforts by communication engineers.

### CA - Certification Authority

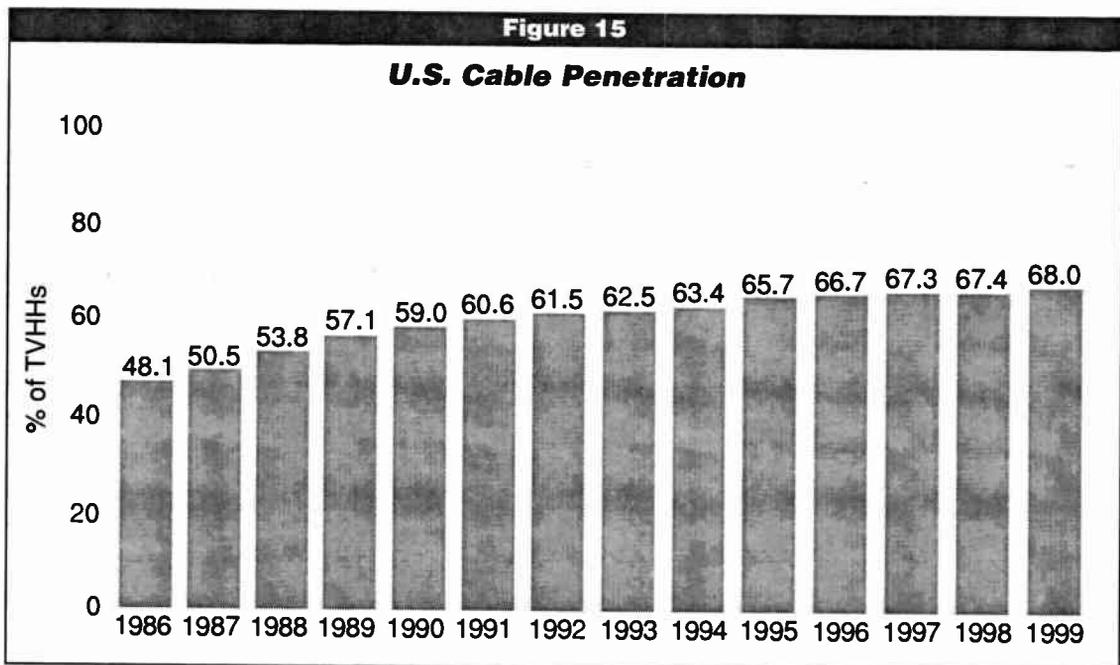
A secure third-party organization that can verify the identity and origin of a person or component seeking access to a private network or Internet site. VeriSign is the leading CA firm at this time.

### CAA - Computer Augmented Acceleration

A laser video disc format that updates the Constant Linear Velocity (CLV) of a disc. A laser disc, by the nature of its shape, contains more information on the outside circumference than on the inside. In order for information to be extracted at a constant number of bits per second regardless of the track or sector in which it is stored, the speed at which the disc spins must accommodate the change in bit density. Since disc sectors are larger on outside tracks, the storage capacity in those areas is greater than one closer to the center of the disc. To retrieve every bit of information on the outer edges, the disc must slow down in order for it to be properly read. CAA gives the computer this ability.

### Cable

Even as DBS subscriber gains have been strengthening, 82% of multichannel service subscribers received their programming from a local franchised cable operator according to the FCC (data as of June 1999.) The cable industry's overall percentage of the multichannel universe, however, is down from the 85% level reported in mid-1998. The number of cable subscribers increased to



Source: Nielsen Media Research

## Cable Broadband

66.7 million as of June 1999, up almost 2% over the 65.4 million subscribers reported in June 1998. The total number of non-cable multichannel households, which includes DBS as well as SMATV and MMDS services, grew from 11.2 million as of June 1998 to 14.2 million homes as of June 1999, representing a 26% increase in this period.

### Cable Broadband (Internet Access, Telephony)

More than 110 million homes in North America are passed by a broadband coaxial cable line and more than 77 million of those homes currently subscribe to cable TV services. The number of North American cable modem subscribers surged to 1.8 million in 1999 and is expected to double by the end of 2000, according to Cahners In-Stat Group. The market research firm forecasts that there will be more than 9.5 million broadband cable data subscribers worldwide by the end of 2002. Cable broadband service revenues are projected to increase from \$1 billion to almost \$4 billion during the same time period by the end of 2002. Subscribers high-speed Internet access via cable are

Table 10

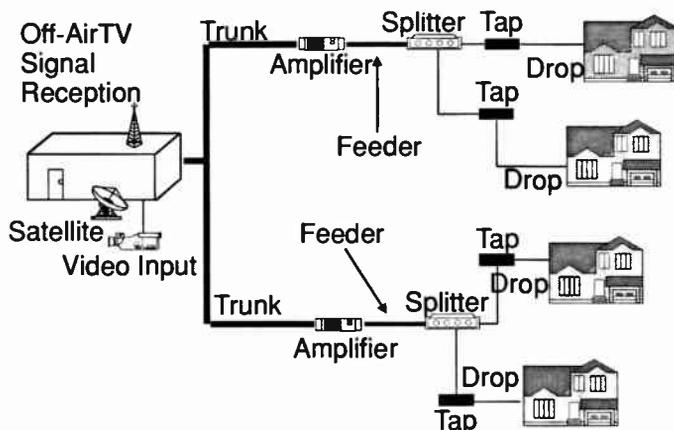
### Top Cable MSOs

MSO	Subs	Comment
Time Warner Cable	12.6M	Data is AOL's top priority
AT&T Broadband	11.8M	Needs cable for Broadband/phone business
Comcast	6.4M	
Charter	6.2M	Part of Paul Allen's "wired world"
Cox	6.0M	
Adelphia	5.3M	
MediaOne	5.1M	Selling to AT&T
Cablevision	3.1M	30% owned by AT&T
Insight	1.0M	Half its subs are in a venture with AT&T
Cable One	0.7M	

Source: Broadcasting & Cable, January, 2000

Figure 16

### Cable Network Schematic



Source: NAB

Table 11

### High-Speed Internet Access

	DSL (subs in millions)	Cable (subs in millions)
1999	0.3	1.1
2000 (est.)	0.9	2.4
2001 (est.)	2.0	3.9
2002 (est.)	3.3	5.7
2003 (est.)	5.0	7.6
2004 (est.)	7.0	9.6

Source: Yankee Group (PC Magazine)

projected to be significantly higher than by telephone DSL service, according to the Yankee Group. Residential cable telephony subscribers are forecast to rise to over 10.7 million by 2006. (See ADSL, Cable Modem)

### Cable Modem

A digital modulating device enabling home computers to use a local cable system to interconnect directly with public or private computer on-line networks and the Internet. Development of cable modems is a strategic move by cable operators to tap into growing consumer interest in the Internet and on-line services and offer a competitive alternative to telephone company computer modem hook-ups. (See Cable Broadband, DSL)

### Cable Radio

Digitally transmitted music services offered by some cable systems, which provide 35+ channels of digital stereo audio services on a subscription basis; some cable audio services also carry local radio station signals. After conversion back to analog, cable-delivered digital subscription and local station services are connected directly to home stereo systems for consumer listening.

### Cable Television

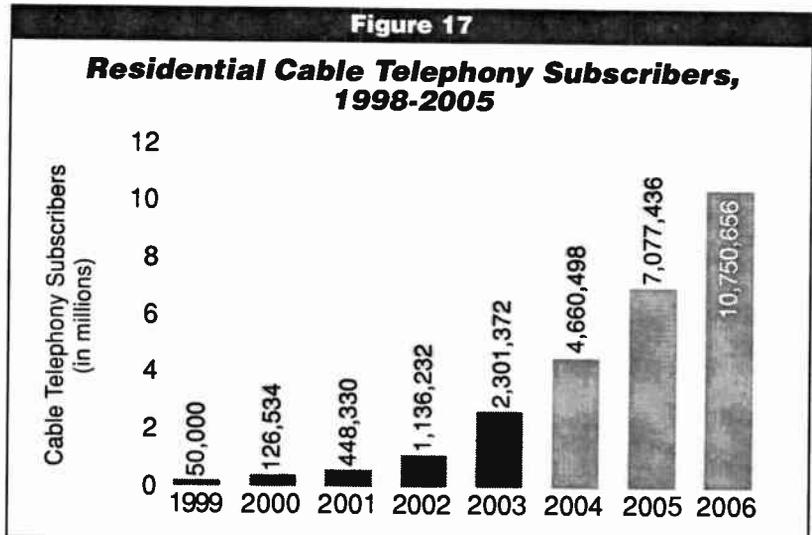
The cable television industry originally began as an antenna service in locations that could not easily receive local television signals. As a mature industry today, it is comprised of a about a dozen leading Multiple System Operators (MSO), and scores of small independent local operators. Cable systems are private coaxial communications networks that distribute satellite-delivered, multichannel pay-TV and other cable program network services, and are required by federal law also to carry all local off-air television signals in a local market. In addressable systems, pay-per-view programming is possible and future upgrading will enable delivery of video-on-demand and other interactive programming.

### Cache

A special type of computer memory designed to speed up the processing of information display by storing often-used information in an easy-to-access location. One example of cache use is allowing Web browsers to save the contents of recently accessed Web pages. Such temporary caching of Web pages enables the user to return to a recent Web page and the text and graphics will load directly from cache and thus be displayed for viewing much more quickly than having to search the Internet again to retrieve the desired Web pages. (See Browser, RAM)

### CAD/CAM – Computer Aided Design / Computer Aided Manufacture

Computer software or hardware designed specifically to assist engineers in the creation and implementation of physical product design. CAD refers to the creation of materials with different



Source: The Strategis Group, Inc.

**Caller ID - Capacity**

software applications on computer hardware. CAM is the process that actually produces a finished product. Often Computer Aided Engineering (CAE) is used to describe both aspects of computer-dependent design and manufacture.

**Caller ID**

A telephone company call-tracing service that allows subscribers to use a display device to reveal the phone number and possibly the name (company or listed name) of the party initiating an incoming call. Users can choose to pick-up and receive the call or not based on this information.

**Call Tree**

1. Refers commonly to a process where one person calls a small number of other individuals with specific information of some immediacy and these persons in turn are responsible to call and relate the same information to a specific set of other people. Often used in disaster relief emergencies or other situations such as snow day school closings, call trees allow the number of persons reached to grow very rapidly.
2. Term also refers to a telecom call management system where incoming calls such as to an 800-number help-line or other central information source is held in a buffer or queue until the next available operator can accept the call. Large systems have numbers of branches to route calls and internal signaling allows the system to recognize when operators are available.

**CAN - Campus Area Network**

A telecommunications/computer network encompassing a number of buildings located in a relatively centralized area. Business parks and traditional university environments are candidates for limited CAN systems. (See Network)

**CAP - Competitive Access Provider**

Refers to a growing segment of telecommunications industry of commercial services that bypass the traditional telephone local network to connect local, long-distance, and switching services in competition with local exchange carriers (LECs.) CAPs typically can offer high-capacity network links for business customers and interexchange carriers (IXCs) and enables them to avoid paying access charges to LECs. Many states continue to deregulate their traditional telecommunications rate regulation roles and instead are encouraging the growth of competition in the local exchange market. Also known as Alternative Access Providers (ALTs) and Competitive Access Vendors (CAVs), companies such as MFS and Teleport have been aggressive in challenging the LECs in major metropolitan markets. These areas are where business customers are plentiful and eager to find ways to cut costs for telecom services, especially as telecommunications becomes an increasingly important part of the e-commerce business market.

**Capacitance**

Physical properties in an electronic system permitting the storage of electrical charges between two electrical conductors. Capacitor devices allow electrical energy to be stored in a certain area of an electrical circuit and accessed when needed.

**Capacitor**

A component of an electrical circuit designed to hold or store electrons (i.e., power). The addition of electrons charges up a capacitor device and the release of electrons discharges electrical power from it. The unit of measurement for quantity of capacitance is farads (F).

**Capacity**

In communications, capacity refers to the maximum throughput of a transmission medium,

system, or network and of related electronic hardware devices. System capacity is always limited to its weakest link. For example, in a 10 Mbps Ethernet network, the capacity or bandwidth throughout the entire network is assumed to be a rate of 10 Megabits per second. If this same network is connected to a 28.8 kbps modem, then communication with the outside world is limited to that data rate instead of the 10 Mbps. (See Bandwidth, Bottleneck)

**Card**

Computer and telecommunications reference to any circuitry-based hardware mounted on a single small board. Add-in cards are used in solid-state electronics to add new functions or capabilities to existing hardware. Examples are SVGA video cards for PCs or an Ethernet Network Interface Card for a LAN system. Small PC cards (PCMCIA) fit into laptop and notebook computers to provide new functions such as modem access to wireless cellphone networks, network interfaces, and fax modems. (See NIC)

**Carrier**

A wireline, RF-based microwave, satellite or other company providing telecommunication, voice, video, data, or other services on lease or contract basis to others. The term "Common Carrier" was a regulatory definition for service providers such as telephone companies that were required to hold their services out to any party wanting lease access to the network. (See Common Carrier)

**Carrier Wave**

An electrical signal that runs at a single continuous frequency. A carrier wave has the ability to be modified or changed to carry information on the signal wave. Information is imposed upon the carrier wave during modulation. (See Modulation)

**Carterfone Decision of 1968**

A landmark court decision permitting non-AT&T equipment to be attached or connected to AT&T's network of telephone lines. The decision was significant as it opened the door to a more competitive U.S. telecommunications marketplace that until then was regulated as a monopoly. Until this time, only AT&T manufactured equipment could be used on the Ma Bells network. Carterfone devices were considered by AT&T to be "foreign" equipment, but the court decreed that as long as any equipment benefited customers and did not cause harm to the network it was to be allowed.

**Case Sensitivity**

Indicates whether a computer system distinguishes between upper-case letters and lower-case letters when performing computer operations such as searches, sorts, typing in Web addresses, etc. Older computer systems are more likely to be case sensitive. For example, the UNIX operating system treats "file.doc" and "File.doc" as two completely different files with completely different names. On the other hand, newer systems from Microsoft, such as Windows 98 and Windows NT, tend to not recognize the difference between upper and lowercase characters. (See UNIX, Windows)

**Castanet™**

Refers to software that makes it possible for a network administrator on a local area network to individually upgrade software on various individual user machines without having to physically access those machines. Manufactured by Marimba, Inc., of Mountain View, CA, Castanet is used to examine old and new versions of software running on various user machines and, once it determines where new software updates are needed, it sends the changes to each user machine individually.

**CAT-5 - CD-Quality****CAT-5**

Describes network cabling that consists of four twisted pairs of copper wire. Cat-5 cabling is by far the most common cable used to connect Ethernet networks, and it supports speeds up to 100 Mbps. It can be used for ATM, token ring, 1000Base-T, 100Base-T, and 10Base-T networking. (See ATM, Ethernet, LAN, Token Ring)

**Cathode Ray Tube**

A type of video display device. (See CRT)

**CATV - Community Antenna Television**

Earlier name used for cable television systems. Community antenna services originated from efforts to transmit local broadcast television signals to areas that couldn't receive signals in mountainous regions of Pennsylvania. The system consisted of a main antenna placed in a high location connected by cable lines to provide access to television programming to homes in valleys. (See Cable Television)

**CC**

Abbreviation for Closed Captioning and refers to text information embedded within transmitted television signals developed to assist hearing impaired viewers understand dialog or spoken words on television entertainment and news broadcasts. (See Closed Captioning)

**CCD - Charge Coupled Device**

An image-capturing device in a video camera using silicon chips to replace older vacuum tube technology. CCDs are sensitive to image light changes and assign a digital value to each level of light intensity, which are stored on the silicon memory chips. Advantages over the standard analog tube cameras are that IC chips don't usually require replacement, image coloring is improved, picture clarity is crisper and truer to an original image, and color balancing on the camera is much easier.

**CD - Compact Disc**

Disc-based format for digital recording and the playback of music/audio information. Digital CDs are based on layers of digitally encoded "pits" that do or don't reflect light when read by a playback machine. Recorded music in its natural analog state is converted to digital information ("1s" and "0s") and stored on CDs for crisp, clear sound during playback.

**CD-I - Compact Disc - Interactive**

A CD-based interactive multimedia format developed by leading consumer electronics manufacturer, Philips. CD-I discs are similar in size to music CDs but contain video, animation, text, audio, or other multimedia materials and are designed for playback on a new CD-I player hooked directly to a television set for viewing. Interactive CD-I software is available for educational and electronic game applications. (See DVD)

**CD-Quality**

Digital Compact Discs (CDs) have become the informal benchmark for measuring the audio quality level of all types of consumer recordings and corresponding capabilities of electronic receiver equipment to reproduce this level of quality. Compact Disc recordings encompass, or exceed, a frequency range of 20 Hz to 20 kHz, with a noise floor of minus 90 dB and a digital sampling rate of 44.1 kHz or 48 kHz. (See CD)

**CD-R/CDR – Compact Disc - Recordable**

Traditionally, compact discs contained prerecorded material for playback only. CDs could not be used for home recording such as another formats including magnetic tape or Digital Audio Tape (DAT). More recently, CD recorder equipment and recordable discs have been introduced making this format available for consumers.

**CD-ROM – Compact Disc Read-Only-Memory**

A read-only format for multimedia software products using a digital disk-based data storage medium. Information on a CD-ROM, including text, audio, video, data, and graphics can only be retrieved or read by a user, not changed or manipulated like the data on a floppy disk. With a storage capacity of 650 MB, CD-ROMs are being used for a wide variety of educational, training, entertainment, and electronic game applications. Storage capacity of a CD-ROM is about 600 MB with most containing pre-recorded multimedia software. Educational, entertainment, electronic games, travel/leisure and many other types of CD-ROM software are available or being developed more rapidly as CD-ROM players are becoming common components in home PCs. (See DVD-ROM)

**CD-ROM-XA – Compact Disc Read-Only-Memory eXtended Architecture**

A somewhat antiquated term that defines a type of CD-ROM where the “eXtended Architecture” portion represented inclusion of audio and some video information. Presently, not really considered an extended architecture as most CD-ROMs have these capabilities; the term, however, is proprietary to Microsoft.

**CD-V – Compact Disc Video**

An early disc-based technology which recorded compressed video onto small digital compact discs. CD-V discs could hold up to five minutes of compressed video, but today's newer technologies have much greater storage capacities.

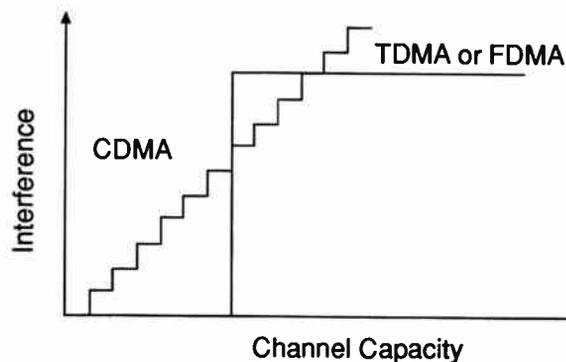
**CD-WO – CD-Write Once**

A standard for writing (i.e., creating or producing) a limited number of copies of a compact disc. CD-WO is used widely in the publishing industry to create test copies of a CD before mass reproduction.

**CDMA – Code Division Multiple Access**

A digital transmission technique being developed by U.S. cellular phone carriers which divides or splits up data information by specified digital codes for simultaneous transmission over multiple digital cellular channels. Similar to other digital protocols (e.g., TDMA and GSM) CDMA uses multiplexing and encoding at the

Figure 18

**Code Division Multiple Access (CDMA)**

**CDPD - Cellphone Market**

transmitter and decoding at the receiver. Signals are reassembled into their original form at end-user points for delivery. Advantages of newer digital technologies compared to older analog systems include improved wireless call clarity and voice encryption support, caller line identification, short messaging, and over-the-air activation. Used in cellular and satellite communications, CDMA differentiates multiple signals transmitted over a broadband channel by coded binary digits attached as a header for a signal. In cellular systems, such methods are useful because calls are assigned to different open frequencies, especially when a mobile phone user enters a different cell area. (See 3G, GSM, TDMA)

**CDPD - Cellular Digital Packet Data**

A relatively new encoding technique being used in some wireless cellular phone systems to transmit packetized units of digital data. Making efficient use of its wireless spectrum during intervals in a cellular phone conversation, segments of encoded data called packets are inserted and sent over a cellular system via a wire, cable, or fiber optic carrier.

**CDV - Compressed Digital Video**

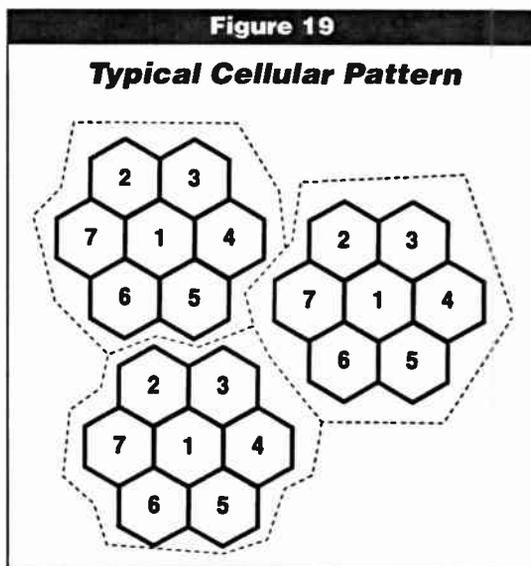
Refers to the process of compressing or reducing the amount of bits in digitized video programming. Generally, digital compression technology is very important in the digital domain but is particularly vital for television and other video transmission systems with limited bandwidth capacities (i.e., satellite). Video compression is critical for future digital television systems, as TV signals are limited to only 6 MHz channels. By digitizing analog video, the amount of bits required to capture all the color and brightness data in each pixel, scan line, and frame is extremely large. Trying to transmit all the digital data from just one half-hour full-motion TV program could take hours. Future ATV or HDTV television increases the amount of digital information in the same half-hour program by orders of magnitude. As a result, video compression techniques are absolutely vital to reduce the amount of digital bits down to a level that can be squeezed into a 6 MHz television signal. (See ATV, Grand Alliance, HDTV)

**Cell**

In wireless cellular telephone systems, signals are transmitted from a central transmitter to a large network of local transmitters, which send and receive mobile calls in relatively small geographic areas called cells. The honeycomb of cells making up a cellular phone service area overlap only slightly. A similar type of system architecture is used for wireless PCS services. (See Cellular Telephone, PCS)

**Cellphone Market**

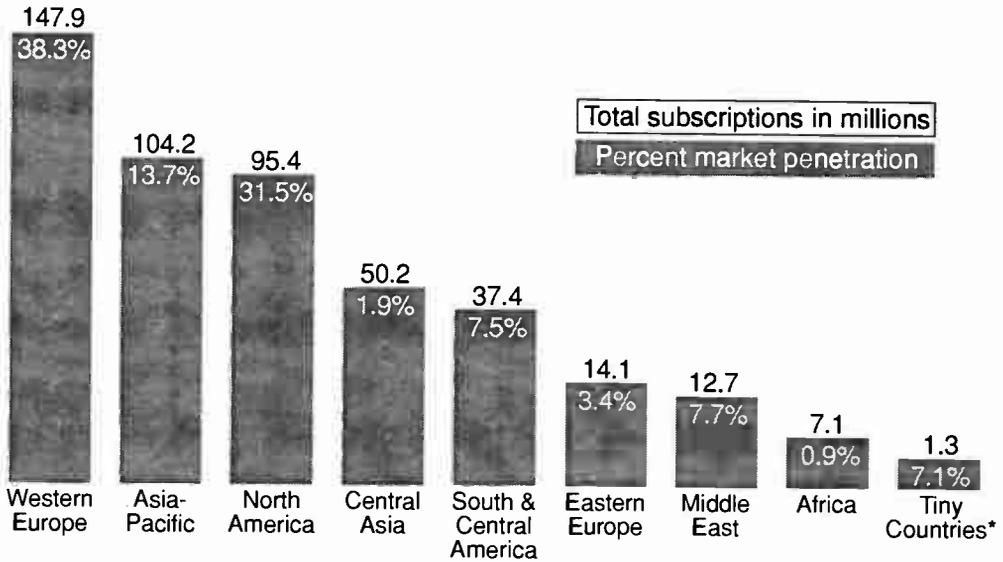
An abbreviated term for cellular telephone. (See Cellular Telephone)



Source: *Wireless Networked Communications*

**Figure 20**

**Worldwide Wireless Cellphone Market**

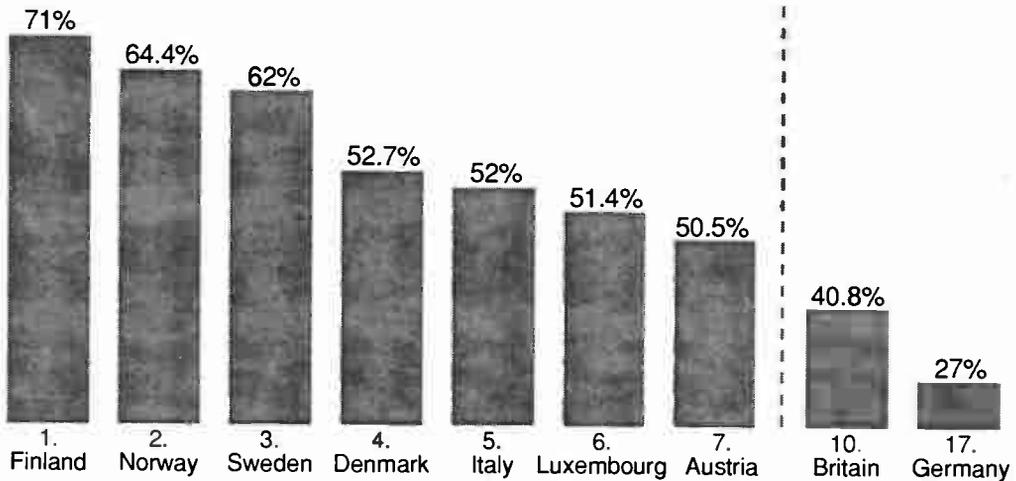


\* Those with a population of less than 1 million; all data as of January 1, 2000

Source: Ovum; Mobile@Ovum, January 2000

**Figure 21**

**European Cellphone Market Penetration\***



\* All data as of January 1, 2000

Source: Ovum; Mobile@Ovum, January 2000

**Cellular Telephone - Centrex**

**Cellular Telephone**

Wireless cellular mobile phone systems are licensed to operate in the U.S. using frequencies between 825 - 845 MHz and from 870 - 890 MHz, with each channel separated by 30 kHz. While traveling, calls of mobile phone users are handed-off from one cell and its specified frequencies to another cell and its frequencies. The seamlessness of the hand-off process is critical to cellular business operations. Cellular phones can be portable hand-held devices or installed in motorized vehicles. In either case, the cell phone has to be authorized for interconnections by a cellular service operator before becoming activated.

**Central Office**

A telephone company end-office or local switching facility where customer phone lines are terminated and interconnected via switching equipment to appropriate local or long-distance lines. In the U.S., a CO can serve as few as 5,000 subscribers and as many as 100,000. (See CO)

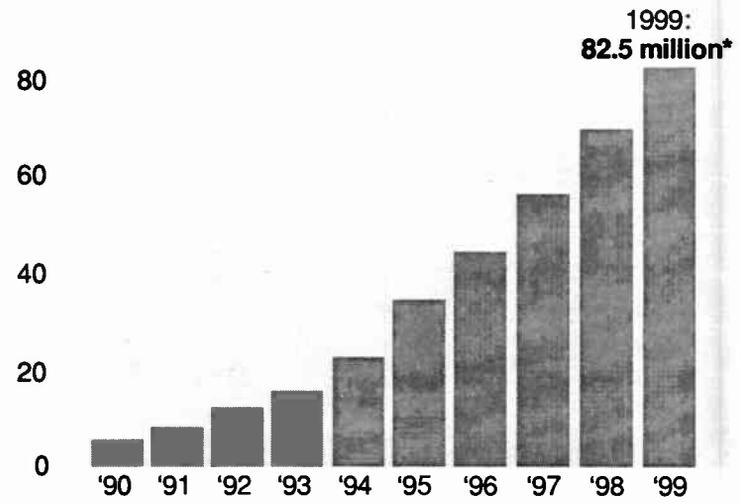
**Centrex**

A package of telephone services for business users with call waiting, call forwarding and fifteen or more additional features unavailable to residential households. Services are acquired from local telephone companies, although such telephony services may become available from long-distance or cable providers as a result of the passage of telecommunication reform legislation. (See Telecommunications Act of 1996)

**Figure 22**

**Cellphone Growth (U.S.)**

Number of U.S. cellphones (in millions)

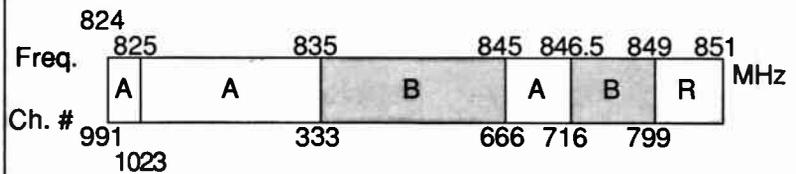


Source: Cellular Telecommunications Industry Association

**Figure 23**

**Cellular Frequency Pattern**

**Mobile transmit**



**Cell site transmit**

A = non-wireline    B = wireline    R = reserved

**CFR – Code of Federal Regulations**

Federal regulations of the United States organized or divided into dozens of Titles or sections, for example, Energy, Telecommunications, or Manufacturing. FCC regulations are found in Title 47 of the CFR. Copies are available from the Office of the Federal Register of the National Archives and Records Administration.

**CG – Character Generator**

A character generator is a text processor for insertion into video productions. Credits rolling at the beginning or end of television programs are originate by a CG system. In high-end systems, character generators perform additional functions to create various visual effects such as wipes, dissolves, color changes, and melting of letters. A library of commonly used transition effects for video is stored on computer disk for later recall as needed. CG effects are used often in car and fast food commercials when the intention is to direct the viewer's eye toward an advertised price.

**Challenge-Response**

Refers to the basic process for determining if a person (often times a computer user) has the right to access a secure place or a secure computer system. When users try to access a protected system or place, they are prompted to supply information such as a username or a smartcard (the challenge) after which users then supply the requested information or swipe the card so they can gain access (the response). (See Authentication, Login/Logon, Password, Smart Cards)

**Channel**

A generic term for any communications pathway, but usually the term is a more specific reference to a pathway that is assigned a certain frequency and is of a defined bandwidth. In cable systems, multiple channels are sent over a single coax cable or fiber optic line, but channels are separated by their individual assigned frequencies. In digital telecommunications systems, subscribers can lease or rent space (actually time) on a channel along with other subscribers. On a digital T-1 line, the transmission frequency is divided into 24 discrete segments called channels, and leased out to subscribers having 24 different telephone numbers.

**Character-Oriented**

A signaling protocol for data transfer where the information being transported has unique characters placed at the beginning and end of the data. These bracketing characters indicate to the receiver or transmitter the parameters of the data being transferred. This capability is especially important when a network is congested with data because it permits sorting or more rapidly distinguishing one segment of data from another for circuit assignment purposes.

**Chat**

A computer slang term referring to real time “online conversations” between any number of networked computer users. A chat system supports the capability for any number of users that are logged into an Internet site at the same time to exchange typed text messages in real-time. Such online conversations can be participated in either by all users logged into the same local computer network system or, as is more common today, conduct online conversations via the Internet. (See Bot, Chat Room, Computer-Mediated Communication)

**Chat Room**

A virtual room or place on a computer network where users can log in at the same time and participate in real-time text-based conversations. The software used by chat rooms typically splits the screen into two sections – one devoted to the ongoing discussion and one where the individual user can compose his or her contribution to the conversation before sending it. Once the

**Chip - Churn**

message is ready, the user simply presses a “send” or “submit” button that transmits the message to a location where it can be viewed by anyone logged into that chat room at that time. (See Chat, Computer-Mediated Communication, IRC)

**Chip**

Refers to an electronic integrated circuit (IC) embedded on a silicon wafer or chip capable of performing designated instructions or controlling certain electronic functions in computers or other electronic devices installed in such things as car ignition systems to VCRs. (See Integrated Circuit)

**Chipset**

Refers to a collection of integrated circuits that are designed to be used together for some specific purpose. For example, one chipset may provide the basic functions of a graphics adapter while another provides the CPU functions for a computer. The term is sometimes used to refer to the primary functionality of a motherboard. (See CPU, Integrated Circuit, Motherboard)

**Chroma Key**

A special effects technique used in video films or television where one source of film or video is inserted into a portion of another video segment through the use of color substitution. For example, when filming a spacecraft model so that it appears to be in space, the model is positioned in front of an evenly lit blue screen. The intended space background is filmed separately or more likely computer-generated. A chroma key effect is used to insert the desired cosmos background to replace the blue screen. The chroma frequencies for blue color are dropped out creating a hole that is filled in by the filmed background shots or the computerized visual display. The use of chroma keying is most often seen in news weather forecasting where map visuals are inserted to appear as if they are behind an on-camera meteorologist. Actually they are standing in front of a green background and a computer-generated map is “keyed” into the green area. Chroma keying replaces everything that is green in the image so attention must be paid to such things as clothing or other items that may be used in the newscast.

**Chrominance**

A video signal is made up of two primary characteristics — luminance and chrominance. Chrominance is the color information, which is based on different values of the three primary colors: Red, Green, and Blue. Two attributes define chrominance — hue and saturation. Hue denotes the basic color while saturation defines the percentage of white that is within the color. A greater percentage of white pushes the color saturation into more of a pastel range while less saturation produces a deeper or more vivid version of the hue. (See Component Video, RGB)

**Churn**

A term commonly used in telecommunications industries to describe the turnover rate in the number of subscribers to a service, or product. Churn rates indicate subscribers are switching to a different service or company, or eliminating service altogether. Many companies have gone to great expense via promotions and advertising to acquire customers, and find it necessary to keep investing especially in customer service areas to retain their customer base. High churn rates making business planning difficult and is costly for companies as they must continually allocate revenues for promotion and marketing to attract new customers, or re-acquire previous subscribers. For example, in 1998 the annual churn in the U.S. wireless market reached almost 26 percent. While 4 million new subscribers entered the market, 16 million customers either switched providers or cancelled service outright.

**CIF - Common Interface Format**

A video format that is part of the CCITT H.261 videoconferencing standard. The format determines the quality of the picture resolution quality of images in a videophone. The accepted CIF standard for videoconferencing is for picture resolution of 288 x 352 pixels at a progressively scanned rate of 30 Hz (i.e., 30 cycles per second). (See CCITT in Appendix)

**CIFS (Common Internet File System)**

Refers to a protocol that makes it possible for files on different computers around the world to be available for users around the world, no matter what operating system they are using on their computer. CIFS uses Internet protocols (TCP/IP) to connect to other computers, but it also uses a special SMB (Server Message Block) protocol that's contained in Microsoft Windows for file and printer access. Therefore, without installing any special software (like a Web browser), users on a CIFS network would be able to open and share files across the Internet using their own familiar desktop software applications such as word processors and spreadsheets. (See TCP/IP)

**CIM - Computer-Integrated Manufacturing**

A broad term used for manufacturing tools connected to computer control devices. An example would be robotic arms on an assembly line. They perform manufacturing functions and are either computer-controlled via a telecom link or have computer-functions installed directly into the robotics. CIM devices tend to cut labor costs and improve precision. Typical CIM functions also include automated supply ordering and quality control checking activities.

**Circuit**

A physical pathway established between two end terminals or stations for purposes of one-way or two-way communication. An electronic circuit provides a flow of electrons in the intended direction at the intended time.

**Circuit Switching**

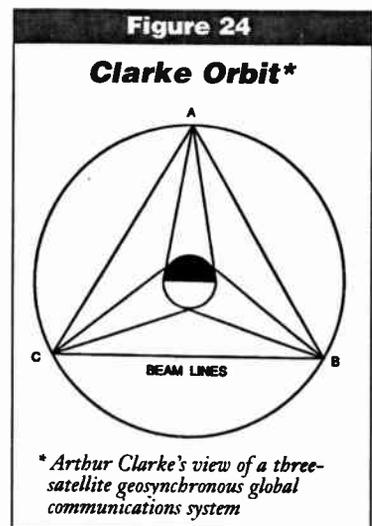
A type of switching protocol that establishes a communication pathway and maintains the connection until the transaction has been completed. The pathway is a "dedicated circuit" in that the signal will maintain the same course of travel throughout the transaction.

**Cladding**

The part of a fiber optic cable that comes in direct contact with the glass core. It is used as a protective device and a method of insulating the lightwaves being transmitted. Although some light is absorbed into the cladding, one of its primary purposes is to surround the core with a refractive surface that is used to redirect any lost light back into the core. This helps insure that the lightwave carrying communication information will not deteriorate or diminish before reaching its intended destination.

**Clarke Belt**

In an early science fiction novel, scientist and author, Arthur C. Clarke discussed a concept in which every point on earth could be covered by three satellites placed equidistantly in an orbit 22,300 miles above the earth's surface. The purpose in the novel for such satellites was futuristic "big brother" government surveillance. Clarke's fiction was grounded in reality when



**CLASS - Click-Through Rate**

scientists confirmed the logic of satellites in geostationary orbit almost precisely at 22,300 miles above the equator that could create communications networks covering the earth except for the polar regions. To honor this futurist, the geosynchronous orbit has been named the "Clarke Belt." (See Geostationary Orbit)

**CLASS - Custom Local Area Signaling Service**

A grouping of optical enhancements to basic local exchange telephone service. CLASS operations use digital switching and out-of-band network control signaling enabling subscribers to screen, selectively reject, forward, trace or redial incoming calls. Caller ID is a feature enabled by the CLASS system. (See Central Office.)

**Table 12****Telco CLASS Services**

CLASS	Description
CLASS 1	Regional Switching Center
CLASS 2	Sectional Switching Center
CLASS 3	Primary Switching Center
CLASS 4	Toll Center
CLASS 5	End Office (i.e., local exchange)

*Source: Industry***Clear Channel**

1. In radio broadcasting, a 50,000-watt AM radio station that has the right to transmit at full power at night is referred to as a clear channel station. Other radio stations operating at less power in other markets may use the same frequency during the daytime hours as a clear channel station, but at night they must significantly reduce power or stop operations to create an interference-free environment for the clear channel station. Clear channel stations are usually "grandfathered" in acquiring this nighttime clearance as they typically have been licensed since the earliest days in radio. Clear channel stations at night have been known to reach thousands of miles across the country, or even further.
2. In another communications environment, a clear channel is a transmission line that has access to its full bandwidth for data transmission. In ISDN lines, a 64 kbps channel is considered to be a clear channel as no part of the line is used for signaling, status, or maintenance of the line. Instead, such information is communicated using a method called "out-of-band signaling." (See Out-of-Band Signaling)

**Click-and-Mortar**

Refers to a commercial business that exists in the physical world as well as online, and as distinct from traditional "bricks and mortar" companies with only fixed building-based operations. (See E-Commerce)

**Click-Through Rate**

The percentage of "ad views," or the number of clicks by viewers on a particular banner ad as a percentage of the number of times that the particular ad was downloaded by end-users. Ads gets downloaded as part of a Web page requested by a user, but a "click-through" count occurs only when a viewer activates the link by clicking on the portion of the Web page containing the ad banner link. If a specific Web page is downloaded by 100 viewers, and 10 of these viewers actually click on the banner ad to view the linked material, the "click-through rate" is calculated as 10 percent of users. (See Ad Banner, Ad View, Ad Banner)

**Client/Server (CS)**

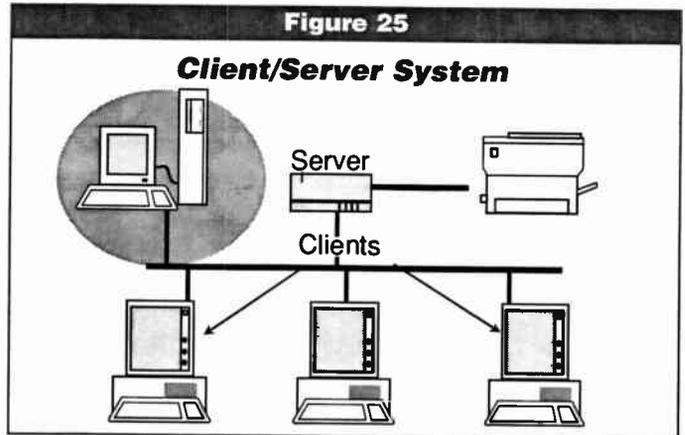
Typically business enterprise-wide computer communications network (LAN) connecting a series of computer workstations (clients) to a central server system. Client/server networks provide shared access to network resources including operating systems, database files, software applications, information files, electronic mail messaging and access to on-line systems. In a true CS environment, accessing applications from a server is a shared process allowing multiple users access to the same application simultaneously.

**Clipboard**

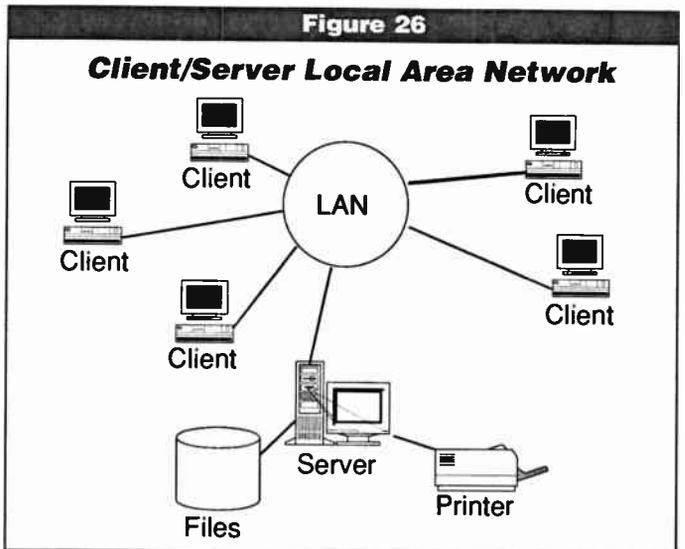
A temporary memory area used by computers that enables the "cutting and pasting" of information from one place in a document to another place in that document or to another document or program. When users select a portion of their document and choose "cut," the information is transferred to the clipboard. When they position the insertion point where they want the information to end up, they can "paste" the information from the clipboard to that specific location. In Microsoft Windows and the Apple Macintosh operating system, the Clipboard can also be used to copy information from one application to another.

**Clipper Chip**

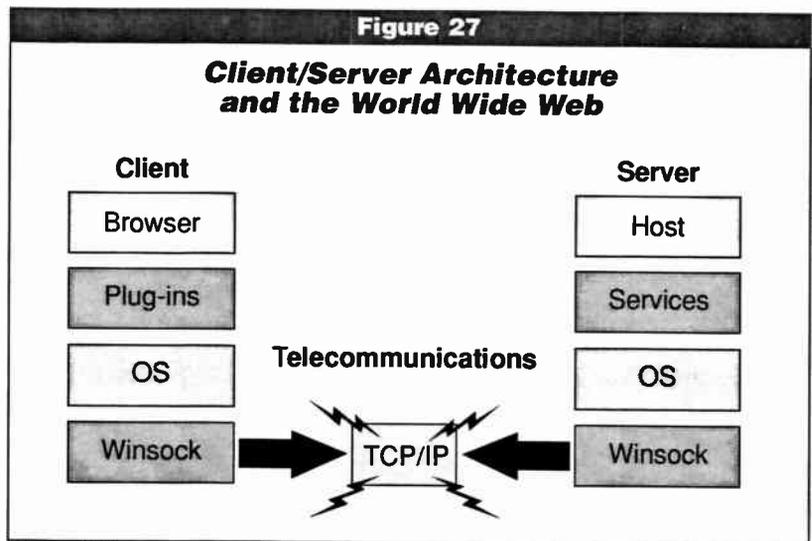
A now infamous failed attempt by the U.S. government to require telephone and computer users to scramble their communications by using a chip containing a specific encryption



Source: NAB



Source: NAB



Source: NAB

**Clock/Clock Speed - CMYK**

algorithm. The algorithm had a "back door" or "public key" embedded in it which would enable government security agencies to "listen in" or look through any publicly transmitted communications or computer data files. (See PKI)

**Clock/Clock Speed**

Generally, clocking elements in a computer or other electronic systems are used to synchronize functions, actions, and/or instructions. In a computer, a clock is a timing control device based upon the movements of an oscillator. The vibration rate or clock speed is one of the determinant factors regarding the speed with which a computer processes information. If a computer runs at 700 MHz, the clock runs the computer at 700 million cycles per second. Understanding how many digital bits of information or instructions can be processed per second is related to other factors such as bus architecture or how the computer's instruction sets are composed. For example, if a computer has a 32-bit bus architecture, theoretically 32 bits can be transferred over that bus every clock cycle. If the clock speed of a computer were 100 MHz, 3.2 million bits could be transferred per second. In actuality, retrieval of data, storage, and other cycle-intensive processes reduce that data transfer rate considerably. (See Microcomputer)

**Closed Captioning (CC)**

Refers to text information embedded within transmitted television signals developed to assist hearing impaired viewers understand dialog or spoken words on television entertainment and news broadcasts. The closed captioning service was launched in 1980. Dialog or other explanatory text is shown in a display box at the bottom of the screen. A special decoder is necessary in order to have the captioned text displayed. In 1990, Congress enacted legislation requiring all television sets with diagonal screen sizes of 13" or greater that are sold or distributed in the U.S. after July 1993 to have built-in closed caption decoders. (See VBI)

**Closed System**

A computer or communications system in which the technical specifications for interconnections are withheld intentionally from distributors, users or other third parties. Such systems also are known as proprietary system.

**Closed User Group**

A group of users that permits direct connection only among members of the closed group.

**CMOS - Complementary Metal Oxide Semiconductor**

Type of semiconductor or integrated circuit processing technique. CMOS is the dominant digital semiconductor manufacturing process in use today largely due to its high-density and low-power characteristics. Also refers to a family of digital logic devices made with this process. Research and development efforts continue to improve IC chip speeds using CMOS processing.

**CMRS - Commercial Mobile Radio Service**

Regulatory classification by the Federal Communications Commission applicable to all commercial wireless communications service providers including cellular telephone, personal communications services (PCS), and enhanced specialized mobile radio (ESMR).

**CMYK (Cyan, Magenta, Yellow Key)**

A color model used for printing that refers to each color according to the presence of cyan, magenta, yellow and "key" (black). CMYK colors are subtractive; meaning that mixing multiple colors creates black. By contrast, RGB color is additive, meaning that mixing multiple colors creates white. (See RGB)

**CO - Central Office**

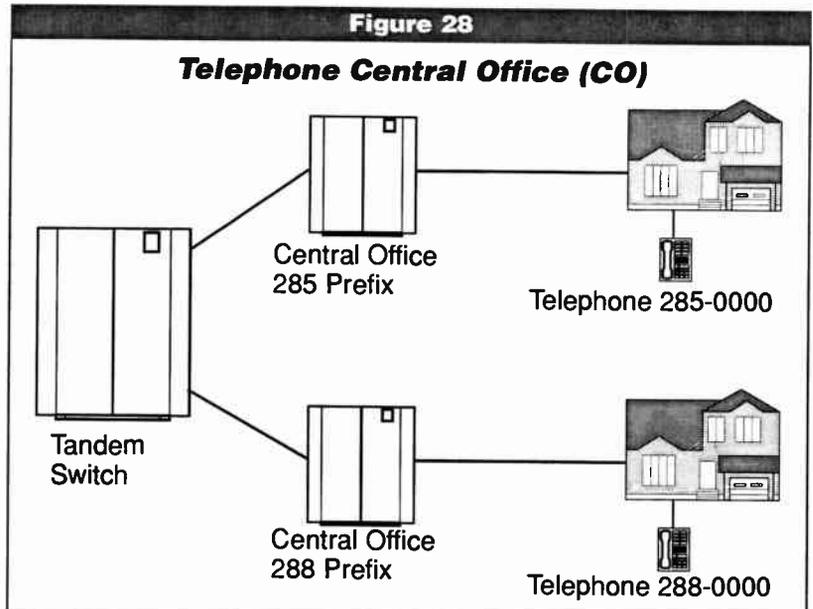
Telephone industry lexicon for a location or connection site where network switches are housed. Originally, COs were actual buildings but today they often are just housing boxes or major switching node sites. COs contain the necessary switching equipment to route calls between local subscribers and/or pass along calls to long-distance carriers, wireless cellular providers, data services, or others. Different classes or types of central offices exist based on the level of services provided and/or what other parts of the network are interconnected to it.

- End Office - the final point before a line reaches a subscriber.
- Tandem Office - a site connecting other COs together. Tandem offices do not directly connect to a subscriber. Other types of COs exist but are unlikely to come to the attention of anyone except telephone system designers.

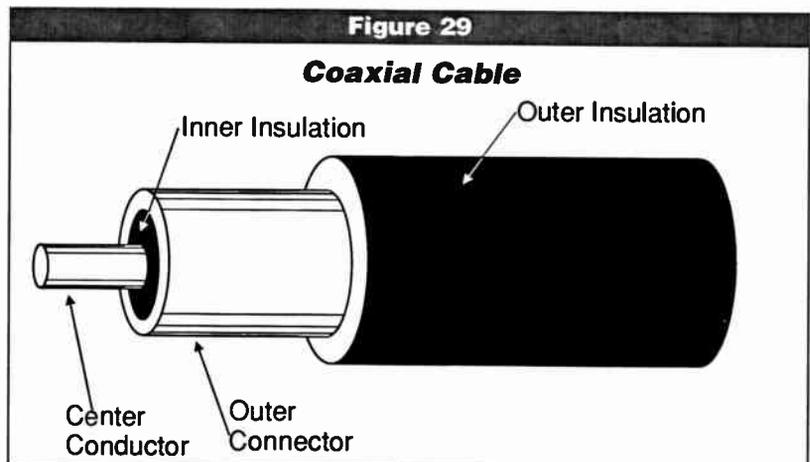
**Coax/Coaxial Cable**

Refers to a type of broadband communication cable capable of transporting very large amounts of analog or digital information. Coaxial cables are classified into many grades but generally have a center conductor wire, surrounding shielding, and insulation material between the two. The physical design enables signals to be

kept inside while other unintended signals are kept out. Some advantages of coax are that it offers a large amount of bandwidth, has good signal isolation, and is useful for carrying very high frequency as well as low frequency signals. Common uses of coax include delivery of multichannel video signals in cable systems, connecting computers together in LAN networks, or connecting high-power television and radio transmitters to station antennas.



Source: NAB



Source: NAB

**COBOL - Color****COBOL – Common Business Oriented Language**

A computer language widely accepted and used in the business community. The language is designed to facilitate development of computer program software that is used to manipulate large quantities of transactions on a mainframe computer.

**Code**

Generally refers to any sequence of information written according to a set of defined meanings. Morse Code is the transmission of dots and dashes. To encode analog information into digital means using binary code used in computers to convert the signal to correspond to 1's and 0's representing the basic "on" and "off" states in electronic circuits. Alphanumeric code means representing both numbers and letters. Using another more sophisticated set of defined number codes (algorithms), signals can be further encoded using encryption or scrambling code. In digital pay-TV systems such as DBS, end-user equipment decodes or reverses all previous binary and encryption encoding processes for home viewing. (See Binary, Encryption)

**CODEC – COder/DECoder**

A term combining coder and decoder and referring to an electronic device or equipment designed specifically to convert voice, video, data or other analog signals to a digital form for transmission. CODECS also can transform received digital signals back to their original analog form. (See Analog and Digital)

**COFDM – Coded Orthogonal Frequency Division Multiplexing**

A technique based on the transmission of a very large number of individual, closely-spaced RF carrier signals to transmit digital information. In conventional digital transmission, a single RF carrier is used to transport a signal from one place to another. Combined with an interleaving mechanism, COFDM techniques can reduce the amount of digital information affected by signal interference when transmitted over-the-air, and helps in digital error correction efforts. COFDM has been proposed for various digital radio and television transmission systems. It has been adopted as part of the Eureka-147 digital radio standard and the Digital Terrestrial Transmission (DTT) System for digital video broadcasting in Europe.

**ColdFusion™**

A product developed to make it easier to integrate Web pages with the information that is contained in databases. Created by Allaire Corporation of Cambridge, Mass., ColdFusion allows Web users to enter information into a Web form, submit that information, and generate a custom Web page that answers the user's query. For example, a user might be interested in finding a Chinese restaurant near his home. ColdFusion would allow that user to enter his address into the Web form, submit it to a database that compares his address with the addresses of Chinese restaurants in the area, rank order them by proximity and then show the results to the user. (See Active Server Pages, Common Gateway Interface, E-commerce, Middleware)

**Collision**

Refers to what happens when two or more devices try to send a signal along the same channel at the same time, usually resulting in a garbled or corrupted message. Computer networks use various protocols to either prevent or to minimize the damage done by data collisions as they inevitably occur. (See Protocol)

**Color**

(See RGB)

**Color Burst**

In broadcast television, a color burst is a series of 9-11 cycles of a color subcarrier signal (carried at 3.579545 MHz) that is inserted into the Horizontal Blanking Interval (HBI). The color burst acts as a color reference to allow TV sets to remain consistently at assigned color values each time a video line is scanned. Without a color burst, the accuracy of the color reproduction would be lower. (See HBI, RGB, Vectorscope, and Video Signal)

**Command Prompt**

A display prompt used in computer systems to indicate when the system is ready to receive a user command. In computers or networks running under disk operating systems (DOS) the command prompt is referred to as the DOS prompt. Although its appearance can be customized, the prompt typically is: A:\> where A is the drive being activated. On PC systems, the "C" drive is usually reserved for the hard drive and the DOS prompt would be C:\> and would be followed by a keyed-in user command. (See DOS)

**Common Carrier**

In telecommunications, a company furnishing communication services to the general public. Interstate common carriers are governed at the Federal level and licensed by the FCC according to defined regulatory rules. Service providers such as telephone companies, satellite carriers or other licensed communications services such as cellular and some new PCS phone services are required to hold out their services on a non-discriminatory basis to any party seeking to access the network.

**Common Gateway Interface (CGI)**

A common gateway interface is a front-end software package designed to make it easy to control the interactions between various Web browsers and the myriad of online businesses marketing goods and services via their own websites. Generally regarded to be the backbone for Internet e-commerce, CGI software makes it relatively easy for Internet customers to add items to online "shopping carts," obtain current pricing information on goods, or search for the lowest priced hotel rooms and rental cars available in a certain location. (See Active Server Pages, E-Business, E-Commerce, Web E-Commerce)

**Component Video**

Color signals used in video production are originated from three basic separate color forms typically: Red, Green, and Blue and referred to as RGB. Processing that uses these separate signals is called component video. Certain video cameras can combine these signals into one output signal, but most professional cameras typically provide three separate color component outputs. A component video system will process these signals while keeping them separate. However, certain component video systems don't use the red, green, blue schematic but instead use an alternative referred to as: Y, R-Y, B-Y where Y is the luminance signal, and the other two carry color difference information. To complicate or confuse things further, there is no single technical standard for component video processing.

**Composite Video**

A video signal which contains all of the color information, including luminance and chrominance, as well as any synchronization information within a single signal. This timing information includes both horizontal and vertical sync signals. NTSC uses these combined signals for sending broadcast television. In relation to component video, composite has somewhat less resolution due

## Compressed Video - Compression Algorithm

to the fact that all of the information is sent over the same bandwidth instead of separating the RGB information from luminance; however, the quality of composite video has been accepted as the standard for broadcast television.

### Compressed Video

Digitized video contains an enormous number of bits of information due in part to the rapid picture frame rate of 30 fps required to produce full-motion video pictures. For example, NTSC television video

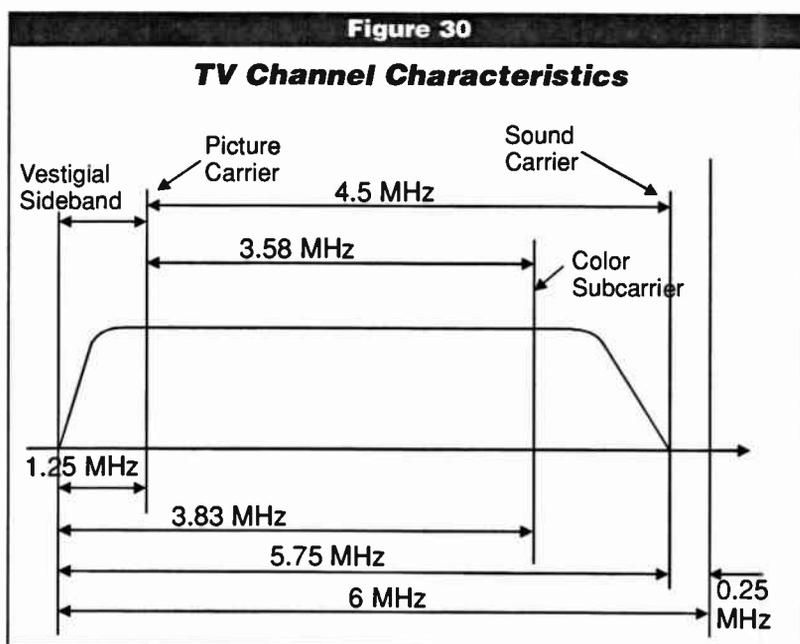
is digitized to about 300 Mbps, whereas new HDTV video signals require digital transmission about 1.2 Gbps. Without compression, transmission of video signals at these high bit rates would be prohibitively expensive due to the large channel bandwidth capacity required to handle these signals especially over long distances. Digital compression techniques are used to create a compressed video format to reduce transmission costs, among other things. Depending on the degree of video compression applied either some or quite a bit of original picture information that is determined to be redundant or unnecessary is eliminated. The quality of the delivered video is determined by how much the signal is compressed. For example, video that is compressed below standard broadcast quality includes VHS-quality or videoconferencing-quality images.

### Compression

Compression is the technical process of reducing digital information to essential components for the purpose of economically transmitting it, but without eliminating the ability for the information to be recreated at the receiving end. Data compression is different from audio or video compression in that data compression systems need to be of the highest quality to avoid losing any digital bits of information. Such systems are called lossless compression. In comparison, audio or video compression techniques discard certain digital bits of information deemed unnecessary or redundant, or remove digital information that won't really be noticeable to human ears or eyes. Removing "redundant" or unnecessary information greatly streamlines the digital transmission process. The removed information is not totally discarded but through other interpolation techniques, the data bits are reproduced and restored at the receiving end. This technique or process is referred to as lossy compression. Using compression techniques, digital audio and video information can be sent at much faster rates without much loss in quality, and require the use of less channel bandwidth be it spectrum, coaxial cable, ISDN line, or copper wire line. (See Digital, Lossy Compression, Lossless Compression)

### Compression Algorithm

A set of mathematical formulas designed to reduce digital information to its barest essentials but only to a level that will allow the compressed information to be accurately restored at the receive-



Source: NAB

ing end and by decompressing the digital information by reversing the application of the same set of formulas. (See Compression)

### **Compulsory License**

A copyright license issued to cable operators and others for the carriage of copyrighted works (programming) in broadcast signals without the consent of the originator or owner(s) of the material. Users must comply with established guidelines and pay prescribed royalty fees. The collected fees are re-distributed annually to the various copyright owners. Compulsory licenses have been required of cable operators and recently were extended to DBS operators to facilitate their carriage of the signals of local television broadcasters. Television broadcasters previously had negotiated and paid for the rights to package the copyrighted programming from various sources including movie studios, sports rights holders, syndication program distributors/owners. In addition copyrighted materials include local-origination programming notably local station newscasts, sports coverage, and locally produced programming. (See Retransmission Consent, Must-Carry, Digital Must-Carry.)

### **Computer**

Any device electronically performing mathematical calculations or logical functions based on a set of instructions. In its simplest form, a computer can be a device dedicated to one type of function such as a numerically based calculator. Three categories of more sophisticated computers able to handle both numeric and character-oriented data are mainframes, minicomputers, and microcomputers which are commonly referred to as personal computers or PCs. (See Mainframe, Microcomputer)

### **Computer-Mediated Communication (CMC)**

Refers to any human communication that takes place or is facilitated by computers. Under this heading are included communication activities such as E-mail, Internet chat rooms, Web discussion groups, and computer video conferencing. (See Chat Room, Discussion Groups, E-mail, IRC, Videoconferencing)

### **Comsat - Communications Satellite Corporation**

After being a quasi-governmental organization for over 30 years in its role as the U.S. signatory to the International Satellite Communications Organization (Intelsat), Comsat is undergoing privatization. Intelsat is an inter-governmental satellite organization that is also in the process of privatizing some of its assets. Members of Congress agreed upon compromise legislation on the future of Comsat and Intelsat in February 2000. The agreement paves the way for Lockheed Martin to complete its 49% purchase offer of Comsat tendered in September 1999. In order to lift restrictions preventing any entity from having a controlling interest in Comsat, the legislation being crafted removes this major interest provision but Comsat - currently with a 20% interest in Intelsat - would lose its exclusive authority to market Intelsat services in the United States. This will allow any satellite provider to negotiate transponder access or buy time directly from Intelsat without having to deal with the U.S. sanctioned middleman, Comsat. However, major satellite competitors such as Hughes' PanAmSat or Loral Skynet, would be barred from directly investing in the global Intelsat system which under the new legislation would be required to go private by April 1, 2001. In preparation, Intelsat will be required to conduct an initial public offering (IPO) between October 1, 2000 and December 31, 2001. (See Intelsat)

### **Conditioning**

Installation of corrective equipment typically on a telecommunications line which modifies or

## Conductivity - Content Provider

improves certain transmission characteristics such as audio frequency response. This is normally done to increase the digital data carrying capacity of the line or reduce disruptive errors that are being introduced into data signals by the physical line.

### Conductivity

Refers to how well a transmission medium can pass an electric signal through it, which is related directly to the resistance properties of the medium. Before the development of optical glass fiber measures of conductivity were limited to gauging the speed at which an electrical current could pass through a line. Some mediums such as copper wires were found to be fairly good conductors. Fiber optics introduced the transfer of digital data and communication signals as lightwaves. In addition to its broadband capacity, the use of fiber has grown because it is considered an excellent conductor as transmitted signals meet very low resistance.

### Connection

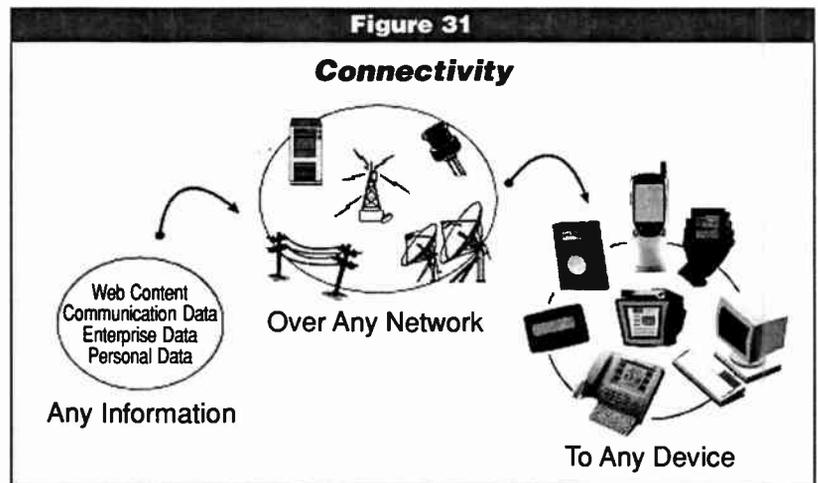
Basically, an established pathway allowing a signal to be transferred from one source to another. Connections apply to any medium including signals transmitted using RF spectrum (e.g., microwave signals), satellites, fiber optics, cable, or copper wire, among others.

### Connectionless Network

A newer type of digital data network commonly used for transmitting packetized data in which the packets don't necessarily have to follow the same path as previously sent data. In connectionless networks, no firm connections or pathways are established, rather packetized data is sent using all different routes and routing can change dynamically depending upon congestive traffic patterns in switching nodes along the way.

### Connectivity

Connectivity is the ability to use a range of electronic resources that act as sort of the electronic glue that binds together different parts of an information infrastructure. It is connectivity that permits networks of computers to link-up so they can then "talk" to each other.



Source: Hambrecht & Quist

### Content Provider

Refers to owners, originators, licensed distributors, syndicators or any other sources of media and/or multimedia material, programming, text, data, etc. The major movie studios and television producers are prime examples of content providers. Companies from CNN, Microsoft and Bloomberg to the emerging breed of Webcasters increasingly are becoming major content providers. Boundaries between traditional content providers and software and multimedia developers are blurring as the end products become more collaboratively created or re-purposed. Microsoft's Encarta CD-ROM encyclopedia is a software application that contains a substantial amount of content. (See Digital Copyright.)

**Control Key**

Refers to the key on a PC keyboard that's labeled "Ctrl" and is used like the Shift key to gain access to a series of keyboard commands that are activated when pressing the Ctrl key along with another key. The equivalent key on a Macintosh computer is known as the "Command key." (See Alt Key)

**Controller**

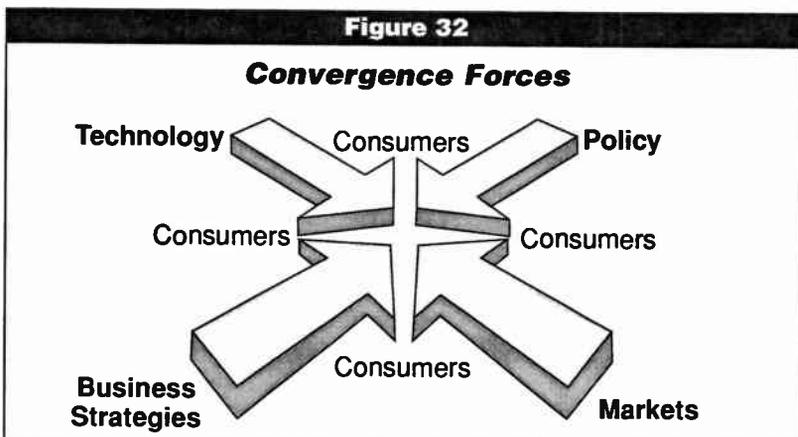
Refers to the part of a computer, typically a separate circuit board, that allows the computer to use certain kinds of peripheral devices, such as hard disks, floppy disks, network cards, keyboards, etc.

**CONUS**

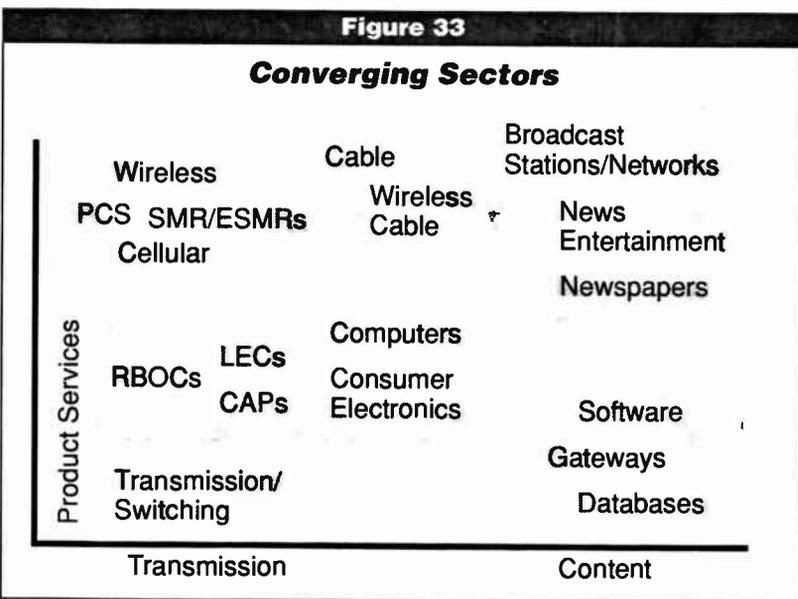
An acronym for CONtinental U.S. and meaning the contiguous lower 48 states of the United States. The term is used commonly to refer to the ability of a communications satellite to provide signal coverage from a specific geostationary orbital location. In video satellite applications such as DTH pay-TV and DBS services, satellites licensed to operate from certain orbital arc positions are capable of providing full-CONUS coverage. Such orbital positions are considered more advantageous than those that allow only half- or quarter-CONUS coverage.

**Convergence**

Term being applied to a rising telecommunications and media communications business trend where previously separate industries — telephones, television, radio, cable, computer, and electronic information — are converging through mega-mergers, buyouts, partnership and strategic alliances. The trend is viewed the result of major advances in technology, the easing of restrictive regulatory structures, national moves toward privatization of state-run communications businesses, and increasing global competition. What is "converging" are different aspects of business, policies and technologies which form the basic underpinnings for the future national and global information highway. Convergence is the change agent



Source: NAB



Source: Adapted from Deloitte & Touche

## Converging - Cookie

enabling competition and the development of new products and services in the telecommunications marketplace. Until now, there have been technological factors that have kept telephone companies from offering video and cable companies from offering telephone services. In the digital domain, these technology barriers are quickly eroding. Fueled by reforms in federal telecommunication policies, regulatory or structural barriers also are being eliminated or lessened enabling many industries to take advantage of next-generation technologies.

### Converging

1. Technical reference to the process within a cathode ray tube or television tube of bringing the three color values (RGB) together from the separate beams projected onto the display screen from an electron gun. For a picture to have clarity, the three separate beams must converge as close together as possible and thus are focused with electronic magnets providing direction for the beams. Each color beam hits a hole in a shadow mask, which is similar to a mesh screen, which further focuses the rays to avoid spill over.
2. A point where two networks with different protocols share a common language and thus are able to communicate with each other. Wide Area Networks (WAN) commonly mix different protocols such as Ethernet with Token Ring and convergence points allow this mixing to occur.

### Cookie

Refers to a packet of information automatically sent from a Web server and stored in a file on an individual's computer. Cookies are typically used by websites to track whether or not a Web browser has visited that website on a previous occasion, where the user went on the website, and whether or not that user is a registered "member" of the website. Cookie entries only can be read by the Web server that sent them thus the user information recorded by one website provider cannot be read by any other party. Nearly all commercial websites use cookies prompting concerns among many users that their online privacy is being invaded, and that cookies are taking up precious storage memory on the computer system. (See Web Server, E-Commerce)

**Table 13**

### Example of a Cookie File

```
# Netscape HTTP Cookie File
# http://www.netscape.com/newsref/std/cookie_spec.html
# This is a generated file! Do not edit.

.cnn.com      TRUE/FALSE 2145801658 CNNid      cf19472d-12368-950457708-1
.avenuea.com  TRUE/FALSE 1265760058 AA002      950457835-50609142/951667508
.doubleclick.net TRUE/FALSE 1920499213 id         df462a69
.intel.com    TRUE/FALSE 2051222459 SITESERVER ID=9c6dd3f30d7ca69539293af287c4311a
.northernlight.com TRUE/FALSE 1581186845 nltr      B-130253204093-38a6f8c4-0000-767423-fb08d9bc
.imgis.com    TRUE/FALSE 1107654527 JEB2      CDE0C212E29BE3BB82FDCC5D3004050C
.deja.com     TRUE/FALSE 1102550519 GTUID     04.25555.5.1.1057.49215
.netscape.com TRUE/FALSE 1293840057 UIDC      130.253.204.93:0950470964:543408
.flycast.com  TRUE/FALSE 1293753600 atf       1_11535735134
.nytimes.com  TRUE/FALSE 1293840058 RMID      82fdcc4238a81f10
```

Source: NAB

**Co-processor**

Similar to the engine that drives a special car, the term refers to any computer processor that assists the main processor in performing special processes, such as mathematical operations (known as a “math co-processor”). (See Processor, CPU)

**Core**

The smallest element of a fiber optic cable; the core is a cylindrical glass tube through which lightwaves are transmitted. The glass core is surrounded by layers of insulation to protect the fragile glass tube and reduce the possibility of light leakage. The refractive nature of the core facilitates lightwave transfers at high speeds, but being made of glass it has disadvantages in terms of fragility and in making clean connections between two fiber lines.

**CPE – Customer Premises Equipment**

A term initially coined in 1968 after a federal antitrust suit against AT&T opened up the customer premise equipment market. CPE was a term initially used to describe any telephone instrument that was not proprietary to AT&T, but later was expanded to include coin-operated phones, PBXs, main stations, and key systems. (See PBX)

**CPM – Characters Per Minute**

The rate at which alphanumeric characters can be recognized or generated per minute. This is often used as a measure of computer printer speed, which is a guide to how fast a page can be printed. Fast laser printers tend to produce anywhere from four to eight pages per minute thus pages per minute (PPM) is becoming a more common way to characterize printer speed.

**CPU – Central Processing Unit**

The critical part of a computer that performs all logical functions, calculations, and transfers and assembles data according to instructions. Computers basically deal with two types of information — instructions and data. Both types of information are represented in binary language which is the only language computer's understand. The function of the CPU is to interpret and execute instructions in order to process data. For a command to be processed it must go through the CPU. In the past, all personal computers had only one microprocessor or CPU, but today certain consumer computers are built with multiple processors. Each interprets instructions and processes data but it may be associated with certain computer functions or tasks thereby freeing up the main processor (CPU) to perform higher level tasks. (See Binary)

**Crawl**

A text-based message aired during a television broadcast usually to inform viewers of important information without interrupting the program in progress. Crawls are created by a character generator and were named to reflect the slow manner in which the text moves across the lower portion of the screen. Examples of crawl messages would be information about tornado sightings, school closings, or local area flooding.

**Cream Skimming**

Activities by a communications provider (or any other commercial business provider) in which the provider seeks to offer services only to the more profitable segments (“cream that has risen to the top”) of a particular consumer or business market. Charges of cream skimming particular where a regulated communications service is under obligation to serve all users while new often unregulated competitive services are under no such obligations and can be selective about the customer-base it chooses to serve.

**Cross Connect - CTS****Cross Connect**

In telecom networks, this refers to connecting two wires through a phone company main distribution frame (MDF). MDFs at business sites are where any series of telco lines are terminated on a "punch down block" which exposes the conductive copper of various lines. Cross connects from one line to another can be made to provide direct connections between two separate lines.

**Cross-Platform**

A term that describes languages, software applications, or hardware devices that work on more than one type of computer system. Software makers have to build different versions of their products to make them compatible with various computer systems, such as Word for Macintosh vs. Word for Windows. Java programs are an increasingly popular example of cross-platform applications because they can run on Microsoft, Macintosh, Unix and other computer operating systems. (See Java, Linux)

**Crosstalk**

A condition where the signal from one circuit crosses over to another circuit. This is what occurs when phone conversations on one line can be heard by those on another line. Traditional telephone copper pair wires are twisted to reduce instances of crosstalk. Typically, 25 - 50 pairs of wire are housed inside a protective sheath. Twisting copper wire pairs together was a technique to reduce voice signals from constantly crossing over to other lines. Outside of the telephone system, this is a generic term for stray pick up from another circuit.

**CRT - Cathode Ray Tube**

Refers commonly to a computer or television screen. A CRT is a vacuum tube that generates picture information through the use of an electron gun that charges phosphor particles on the front of the television screen. The charged particles each have a color value of red, green, or blue from which video images are composed for display.

**CSU - Channel Service Unit**

A telecommunications device used in digital T-1 or ISDN lines that checks the integrity of the line as well as provide connectivity to other digital sources. A CSU is kind of a demarcation point where the telephone company's digital line connects to a user's digital premise equipment.

**CTI - Computer Telephone Integration**

The use of a computer to answer and route telephone calls. The computer contains a database, which keeps track of the calling party, the receiving representative, and other pertinent information about the caller (such as name or location). The incoming call is identified and passed through the computer database. The computer then instructs the telephone to switch to the correct representative.

**CTS - Clear to Send**

One of the most common computer connection interfaces (i.e., cable line and pin socket located at the end of it and called an RS-232-c interface) is used for hooking a PC to a peripheral device. This interface connector has 25 pins. Each pin acts as a conductor that performs an individual task, such as sending or receiving a certain type of signal. The Clear-to-Send pin is pin #5 on the RS-232-c and its purpose is to deliver a message to the connected peripheral device (printer, fax modem, external CD-ROM) indicating that the computer is ready to transmit data to it. (See RS-232)

### Current (Electrical)

A measure of the amount of electrons that flow in one second through a point in an electrical circuit. Current flows in one of two ways, as an alternating current or as a direct current. (See AC Power, DC Power)

### CU-SeeMe

Refers to one of the first Internet-based videoconferencing programs that is used to transmit audio and video signals. A free version of the program was developed at Cornell University. A company called WhitePine, Inc. sells a more sophisticated commercial version. Users must have a sound card, speakers, and a video camera installed on their personal computers. (See NetMeeting, Teleconference, Videoconferencing)

### CV - Composite Video

A video signal which contains all of the color information, including luminance and chrominance, as well as any synchronization information within a single signal. (See Composite Video)

### CyberCash

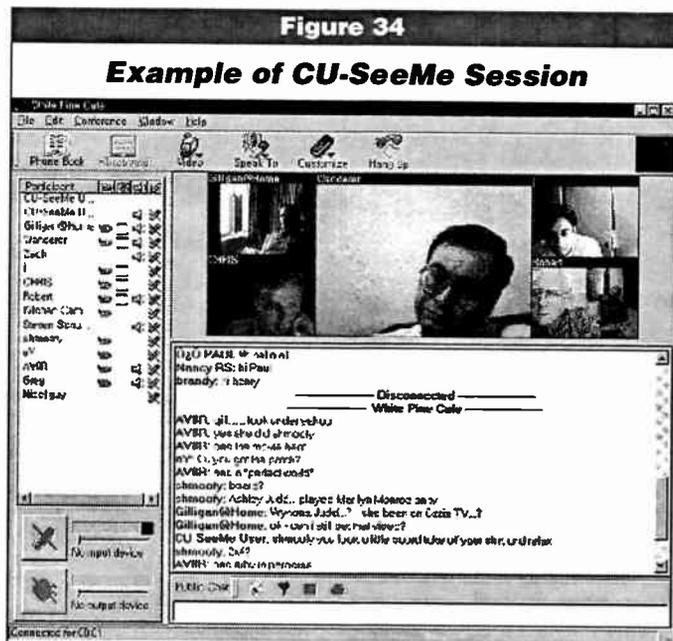
An integrated electronic-payment system developed by CyberCash Inc. and used by e-commerce servers to verify credit cards and process payments. (See Electronic Wallet)

### Cyberpunk

Originally a cultural sub-genre of science fiction taking place in a not-so-distant, often-dystopian society. The term grew out of the work of William Gibson, Bruce Sterling and Rudy Rucker – science fiction authors devoted to the issue of cyberspace – and has evolved into a cultural label encompassing many different kinds of attitudes. It now includes clothing and lifestyle choices. The term was supposedly coined by Katie Hafner and John Markoff in their book *Cyberpunk: Outlaws and Hackers on the Computer Frontier*, in which they essentially describe a cyberpunk as a computer hacker.

### Cyberspace

A term coined in 1984 by science fiction author William Gibson in his seminal book *Neuromancer*. Literally, “the space of cybernetics,” the virtual space of computer memory and networks, global telecommunications, and digital media. Cyberspace refers to the virtual space where messages and information reside in transit between telephones, televisions, and computers. The term is now almost synonymous with the Internet, online and digital world. (See Internet, Online)



Source: Keyscreen.com

**Cybersquatting - Cycles per Second****Cybersquatting**

Refers to action of registering one or many Internet domain names for little or no cost, for the expressed purpose of reselling the name for a profit. One of the more notable transactions was the domain name wallstreet.com, which was registered in 1994 for \$70 and sold for one million in 1999. Some people have registered every common name and name combination in the off chance of making a fortune from selling it to another organization or person.

**Cycles per Second**

A unit of measurement for the frequency of an electromagnetic signal (sine wave) where one Hertz represents one cycle per second. (See Hertz)

**Table 14****Selling Domain Names\***

Domain	Price	Purpose
Bingo.com	\$1.1 million	"Bingo-based e-mail community"
WallStreet.com	\$1 million	Online "wagering" on stocks
Drugs.com	\$823,456	Pharmaceutical and drug portal
University.com	\$530,000	A training education "super-portal"
Blackjack.com	\$460,000	Online gambling

*\* five of the most expensive domain names sold in 1999*

*Source: Wall Street Journal Reporting*

**D/A – Digital /Analog**

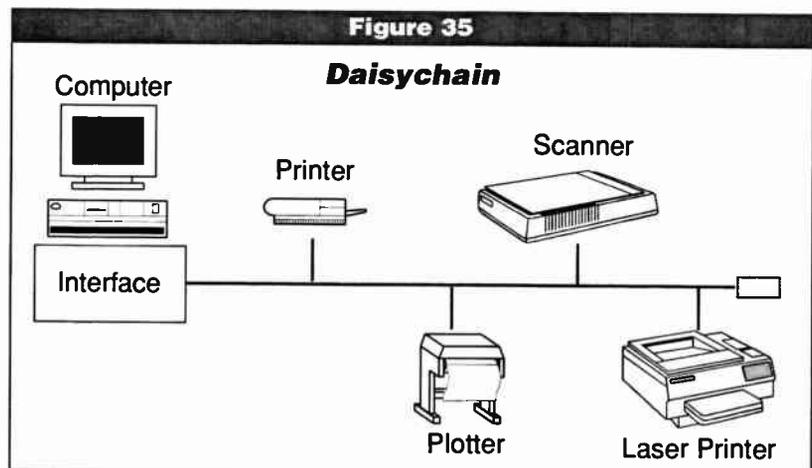
The process of converting digital binary samples of information to analog signals representing sounds or pictures. This is the reverse process of converting an analog signal into a digital signal. Devices for D/A conversions are necessary in all digital systems carrying audio or video as human eyes and ears essentially operate as physical analog receivers capturing sight and sound as either light images or vibrations. As a result, all digital music or video must be converted back to its original analog form for user playback. (See A/D)

**DAB – Digital Audio Broadcasting**

A developing new technology for broadcasting radio signals in digital, that will deliver compact disc-quality sound free of interference and noise to radio listeners. Originally, seven proposed DAB systems had been tested in the United States. Both in-band, on-channel (IBOC) and in-band adjacent channel (IBAC) systems were in development. Each variation would enable AM and FM broadcasters to transmit DAB on the same frequency channels as their existing analog AM or FM signals. DAB will transmit audio information as a series of digital bits in a way similar to DTV, wireless phones and computers. In the intervening time, the industry has moved toward an IBOC solution and looks forward to beginning implementation of digital radio broadcasting in the foreseeable future. (See IBOC)

**DAC – Digital to Analog Converter/Conversion (See D/A)****Daisychain**

Refers to connecting a number of electronic devices together in a network where a signal has to pass through each device to be received by the one located at the end of the chain. Depending upon the connections, some networks using daisychains provide two-way communication, whereas in connecting equipment such as VCRs in a daisychain the transfer of information is only one-way.



Source: NAB

**Dark Fiber**

Also referred to as “dim” fiber, it is optical fiber that has been installed for future use, is no longer in use, or the communications system for which it is installed is not yet up and running. As a result, no lightwaves are transmitted on the line; hence the fiber is dark.

**DAT – Digital Audio Tape**

A technology for recording digital music on high-quality magnetic tape. The digital tape format was developed in response to the popularity of digital CDs. Although not as sturdy as CDs, DAT offers the consumer a digital quality audio format that also could be recorded on.

**Data - Data Broadcasting**

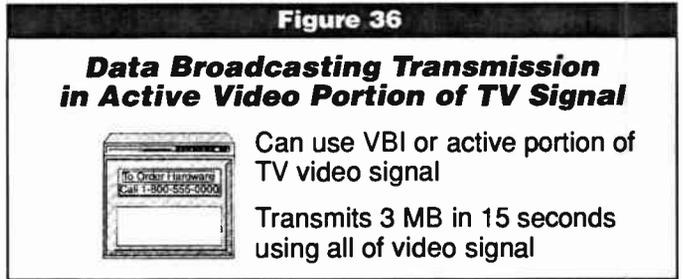
**Data**

A generic reference to any type of digitized information. Digital data may be traditional number data such as banking transactions. But in the digital domain, all information is converted to numbers in the form of binary bit streams of 1's and 0's. Hence, there is voice data, audio or music data, picture or video data, text, graphics, or symbol data. A lot of data often is later transformed back into video images, words, music, graphics, or even "regular" numbers (in Base 10) and used as financial information, news clips, movie scores, animated cartoons, etc.

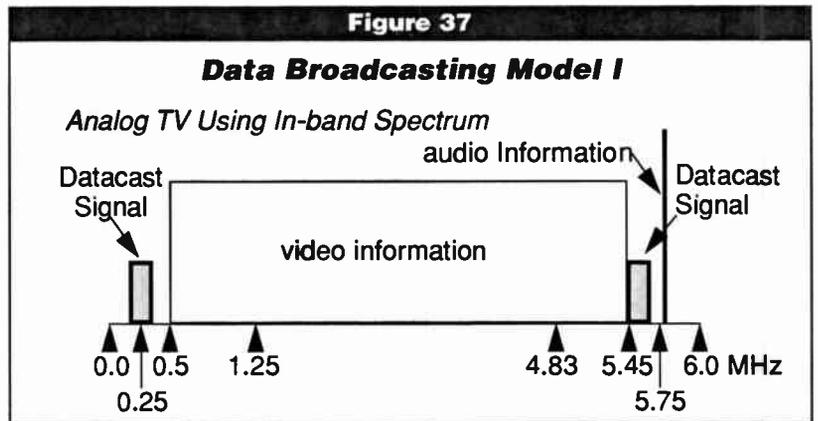
**Data Broadcasting**

Refers to a broad range of digital data services that might be provided by radio and television broadcasters to carry digitizing information or data. Data broadcasting services can be provided using exiting analog subcarriers or via other in-band digital RF transmission techniques.

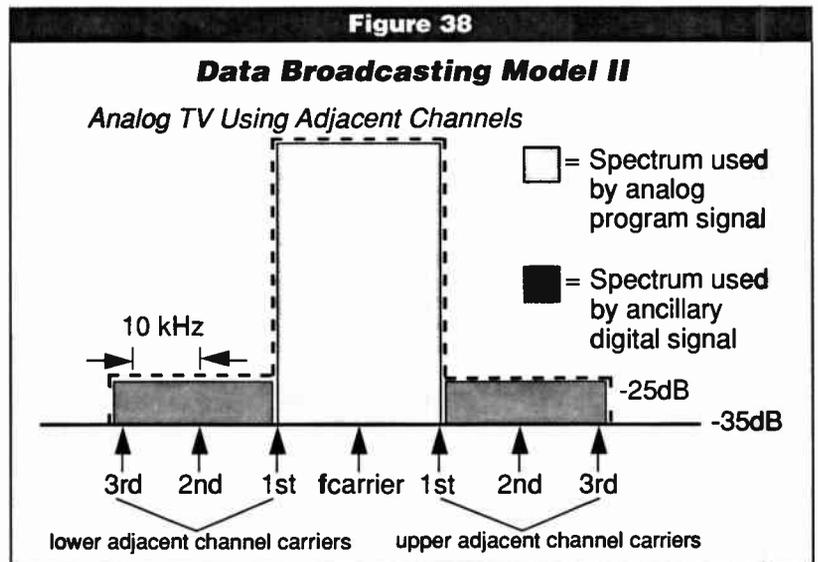
Pending transitions to all-digital radio and television broadcasting platforms, datacasting will provide expanded options to offer multiple audio, video as well as other supplementary data / information or interactive services, within the same bandwidth now allocated to each station. A host of new consumer digital receiver devices will be able to decode data broadcast signals for display as simple text, video, graphics or as multimedia news clips, and tie-in advertising coupons, or subscription data or text services. Digital compression expands future opportunities to offer multiple datacasting services even further. Essentially, data broadcasting relies on digitization of information, (e.g., voice, video, data, graphics, etc.) to transmit addressable



Source: NAB



Source: NAB



Source: NAB

packetized data simultaneously to a wide variety of specialized receivers. Data/information services could be transmitted for display or storage to TV set-top boxes, PCs, laptops equipped with wireless modems, PDAs or other wireless appliances.

Operationally, a DTV stations could transmit a variety of options: 1) a primary video signal to HDTV receivers; 2) while also sending a separate

programming channel to sets with built-in temporary memory storage capacities for later recording on a VCR; and 3) one or more separate data text signals that a viewer could choose to view on-screen immediately using a remote control unit. These separate data streams could contain: a) text or graphics materials adding information about current programming, b) sports box-scores during games, c) information-on-demand about advertisers, or d) electronic coupons. At the same time, other datacast bitstreams could be providing: 4) paging/messaging services, or 5) various other business information, data, or text services to wireless customers with business datacasting receivers. (See Datacasting)

### Data Communications

(See Data)

### Data Link

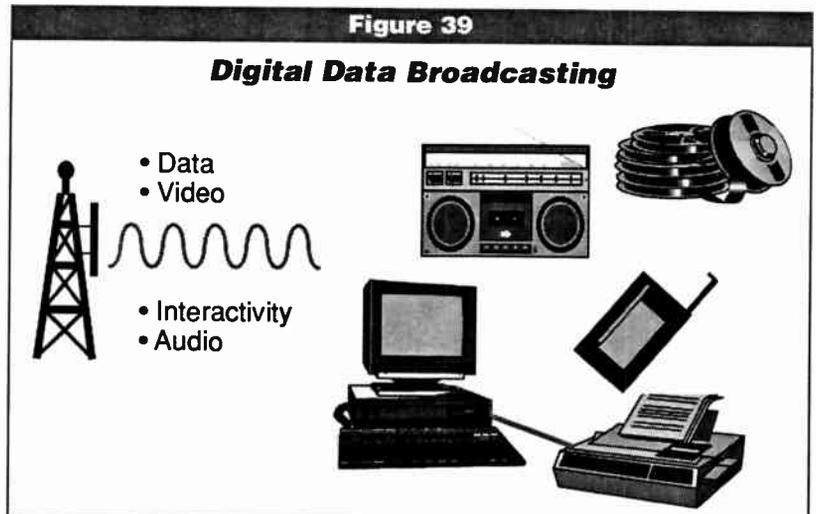
Series of digital telecommunications transmission elements (equipment, line, computer interfaces) combined to provide connectivity between two end users in a network. The successful transfer of digital information between the two nodes in a network establishes a data link.

### Data Mining

The process of analyzing data and looking for trends or tendencies in large databases that might produce economically viable information. Data mining has emerged as a very hot market in corporate America that focuses on making productive use of the massive amounts of information stored in all types of databases, from customer records to transaction reports to inventories and product histories. Data mining is just one of the many dimensions of the growing "Information Age," in which information itself becomes a commodity. (See Data Warehousing, Relational Database)

### Data Packet

Refers to a single frame in a digital packet-switched message. Most data communications is based on dividing the transmitted message into packets. For example, an Ethernet packet can be from 64 to 1518 bytes in length.



Source: NAB

**Data Rate - Data Warehousing****Data Rate**

A measure of the amount of digital bits transferred in a set period of time. The data rate of a line or channel in the network is its capacity to transmit digital information at a constant speed and is measured typically in bits per second. (See bps)

**Data Stream**

Refers to the transmission of a series of data in a continuous stream where there are no gaps or pauses. (See Bit Stream Transmission)

**Data Vaulting**

Referred also as "remote backup services," data vaulting is a process used to protect important data by storing it at another physical location, usually off-site, for safe keeping. Some companies provide Web-based backup services enabling customers to store data on their servers. These firms offer several security measures including backup power supplies, data encryption, and staffed security. (See Archive, Data Mining, Data Warehousing, Encryption, Incremental Backup)

**Data Warehousing**

The process of storing, organizing and retrieving information in typically large data bases. Data warehousing often involves the use of special software that compresses the data and also makes it more easily searchable. Data warehouses can also contain "snap shots" of corporate data that can

**Table 15****Digital Data Rate Measures**

Prefix	Letter Abbrev.	# of Bits /bytes	Power of 10
Kilo	K	1 Thousand	10 <sup>3</sup>
Mega	M	1 Million	10 <sup>6</sup>
Giga	G	1 Billion	10 <sup>9</sup>
Tera	T	1 Trillion	10 <sup>12</sup>
Peta	P	1 Quadrillion	15 <sup>15</sup>
Exa	E	1 Quintillion	10 <sup>18</sup>
Zetta	Z	1 Sextillion	10 <sup>21</sup>
Yotta	Y	1 Septillion	10 <sup>24</sup>

**Table 16****Digital Transmission Rate Measures**

Time Period	Letter/Symbol	Fraction of a Second	Power of 10
Millisecond	ms	1 Thousandth	-3
Microsecond	μs	1 Millionth	-6
Nanosecond	ns	1 Billionth	-9
Picosecond	ps	1 Trillionth	-12
Femtosecond	fs	1 Quadrillionth	-15
Attosecond	as	1 Quintillionth	-18
Zeposecond	zs	1 Sextillionth	-21
Yoctosecond	ys	1 Septillionth	-24

Transmission Type	Measurement
Network Line/Channel	bits/sec
Disk Transfer Rate	bytes/sec
Disk Access Time	ms
Memory Access Time	ns
Transistor Switching	ns, ps, fs
Machine Cycle	μs, ns
Instruction Execution	μs, ns

be analyzed without slowing down the day-to-day operations of the company. As more and more companies convert their operations from paper to computer, more and more thought and planning needs to be devoted to deciding how much information needs to be “warehoused,” for how long, and in what format. (See Data Mining, Relational Database)

### Database

A collection of computerized information (i.e., data) that is related to a particular topic or purpose. Databases generally impose structure to the information enabling easier and faster data retrieval, manipulation, and management. Some of the leading database application software includes Access, dBase, Oracle, and Paradox. A database management system (DBMS) is a formal system of rules, logic, relationships and data that can be maintained independent of specific hardware platforms and operating environments. (See Data Mining, Data Vaulting, Data Warehousing, Flat File, Middleware, ODBC, Relational Databases, Replication, SQL, Table)

### Database Server

A database server is designed specifically to store a large database of information that can be accessed by other computers or workstations on a network. Typically, database server systems operate with more memory and management capabilities than other computers in a network. Such servers allow information to be shared among many users thus eliminating the need to store applications, files, or other network services on each individual computer in the network.

### Datacasting

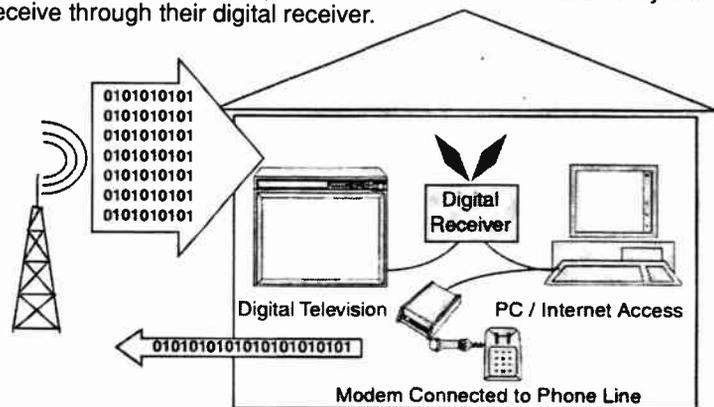
A developing industry providing digital data transmission services over television or radio broadcasting facilities. Also referred to as data broadcasting, business plans for datacasting services include a wide range of potential consumer applications, business-to-business (B2B) services, and ancillary interactive television data streaming options. Datacasting services will be among the expanding array of digital services that could be offered by television broadcasters after converting from current analog to DTV operations. Datacasting is part of the expanding

wireless communications universe. DTV datacasting operations will have advantages of a wide coverage area and highly recognizable local name recognition for marketing and cross-promotional purposes. Datacasting technology continues to be refined allowing consumers to download

Figure 40

### Datacasting Model

Under a datacasting model, choice is retained by the consumer. Massive amounts of information are transmitted to the home – TV and Radio programming, Internet downloading, and other ancillary digital services. Consumers can pick and choose the information they want to receive through their digital receiver.



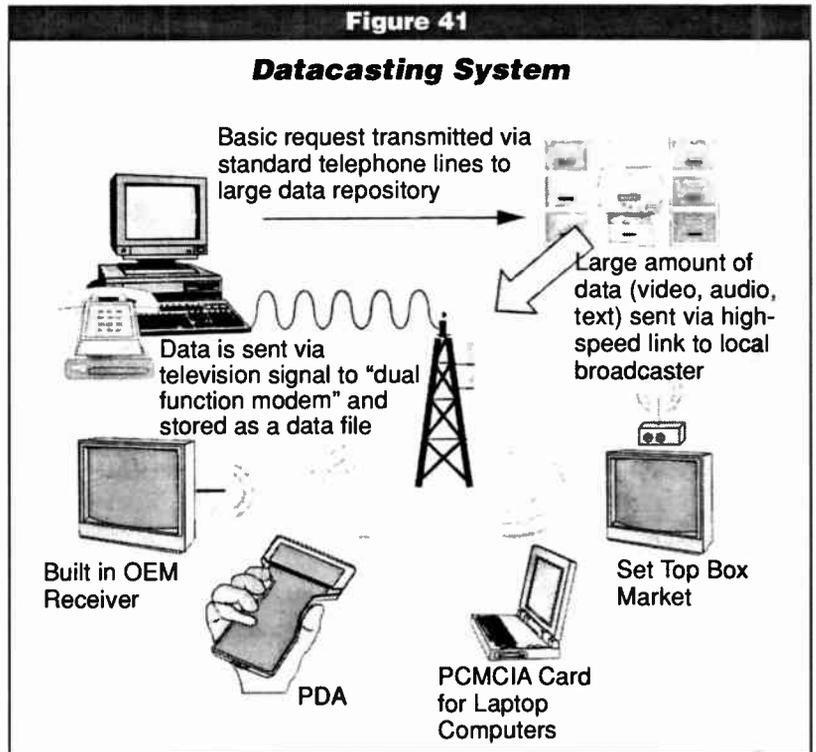
The consumer can request that data be imbedded in the digital signal (such as Web pages or other computer information) by sending a small signal back to the broadcaster. Because of the minimal bandwidth requirements, this signal can be sent on a standard phone line or a narrowband transmitter.

Source: NAB

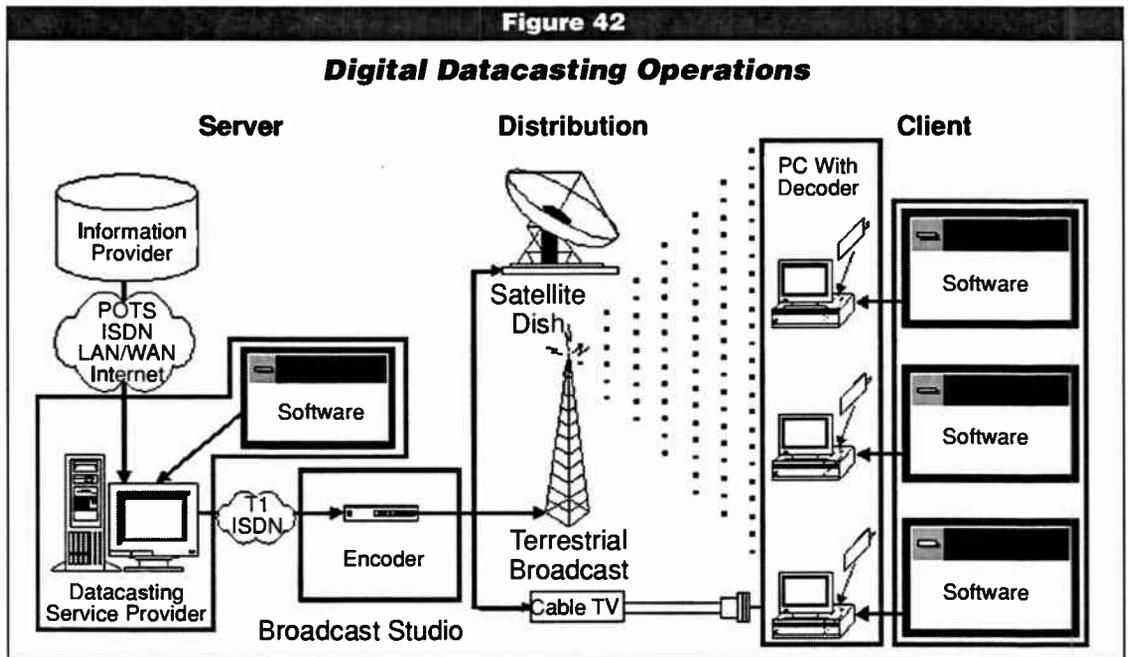
high-quality video and Internet data speeds up to 7.0 Mbps – a huge leap up from the 56 kbps of dial-up modems. Regardless of the datacast service – data, text, interactive video program-related information, downloading of advertising coupons home viewers – datacast signals will be broadcast from a central source to a large, potentially unlimited number of specialized data receivers throughout a local coverage area.

Examples of datacasting ventures include Granite Broadcasting's plans to broadcast Internet content over the digital

spectrum, using datacasting equipment developed by SkyStream Corp. WRAL-TV Raleigh, NC has begun a pilot datacasting program in joint partnership with DTVPlus and LG Electronics. WRAL has set aside 2 Mbps of its DTV bandwidth to carry the datacast content, a repackaged version of WRAL Online, the stations' Website. Content on the Website is captured at 6 AM and



Source: NAB



Source: NAB

datacast continuously throughout the day. Datacasting involves transmitting one or a series of narrowband digital services to a variety of small, low-cost wireless receivers and/or decoder boxes that plug into home TV sets or PCs. Commercial start-up Geocast has developed technology to broadcasting Internet content over DTV channels. Large volumes of data will be able to be transmitted simultaneously over high-speed digital TV channels, along with a HDTV video programming. WaveExpress, a joint venture of Sarnoff Labs and Fantastic Corp., and Wave Systems, intends transmitting data to a DTV receiver card installed in PCs.

A stand-alone set-top box receiver is in development by Geocast, and the major group broadcast partnership, iBlast, has said datacasting potentially offers television stations a profitable ancillary digital business service that could become a low-cost alternative to high-speed "broadband" cable modems or telco DSL service providers.

### **Datasuit**

A body suit with an array of electronic motion devices that translate physical body movements into digital data enabling the wearer to be used as the motions for graphical animations, or to enable the user to participate in a virtual reality system. (See Motion-Capture Bodysuit, Virtual Reality)

### **Daughterboard**

A daughterboard is an extension of a computer's "motherboard" or main circuit board. It usually is a secondary circuit board that is used to plug in smaller boards. A daughterboard needs to be connected to the motherboard, but not all data has to be transferred through the motherboard. If two peripherals need to communicate with each other, the information transfer could take place through the daughterboard providing both peripherals are connected to it.

### **DAVIC (Digital Audio Visual Interoperability Committee)**

Devoted to bringing the benefits of digital convergence to the average consumer, DAVIC is a broad-based industry standards-setting group that is proposing recommended standards for end-to-end interoperability of broadcast, interactive digital audio-visual information and related multimedia communication material(s). DAVIC represents all sectors of the audio/visual industry including electronic equipment manufacturing (computers, consumer electronics, telecommunications), media/information services (broadcasting, cable and telecom), as well as relevant government oversight agencies and high tech research organizations. (See Convergence)

### **dB - Decibel**

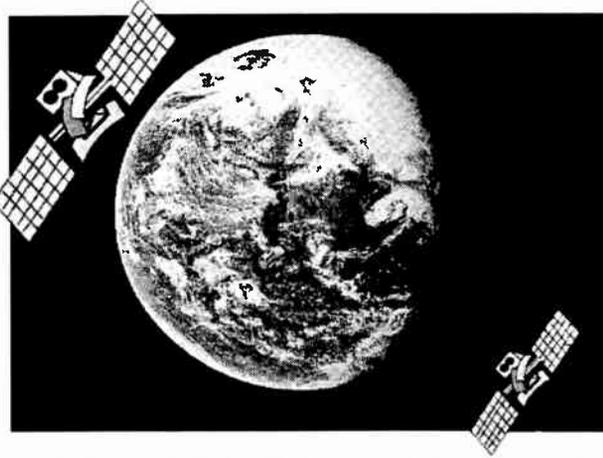
This reference is often used as a measure of the relative amount of power in a system as compared to a reference magnitude. For example, dBk is the amount of power in a system relative to 1 kilowatt of power. The letter after the 'dB' is critical since that establishes the reference point of the ratio. If there is no letter after 'dB' then only the ratio, not the absolute value of the measurement can be determined. For example, a change of +3 dB in the power of a signal is the same as doubling the power, and a change of -3 dB is the same as halving the power. Decibel ratios are calculated by taking the logarithm of a ratio and multiplying that by a constant, usually 10 or 20. The dB method is used to describe differences in voltage, current, field strength, pressure, density, etc., but the constants in the formula for the ratio of each of these quantities are different. Since the calculations involve logarithms, converting values to dB ratios reduces the chance of mistakes in placing a decimal when working with systems that have very large and very small values, such as TV and radio signal generation and transmission systems.

**DBS****DBS - Direct Broadcast Satellites**

Direct Broadcast Satellite services, also referred to as direct-to-home (DTH) services, use high-power satellites transmitting on internationally designated Ku-band frequencies to provide 100-200 channels of video, sports, news, pay TV, premium PPV events (e.g., sports, concerts), more recently Internet services. Since its U.S. debut in late 1994, DBS has continued to erode market share away from the cable industry, impacting cable's long-held dominance as the

leading multichannel provider of video entertainment services. In its Sixth Report on the Multichannel Marketplace released in mid-January 2000, the FCC noted that between June 1998 and June 1999, DBS subscribers grew from 7.2 million households to 10.1 million households. According to this report, DBS in late 1999 accounted for 12.5% of all multichannel video subscribers nationwide, and by year-end 1999, U.S. DBS subscribers totaled 11.4 million.

Also according to the FCC's report: 1) the ability to receive local television station signals from DBS satellite operators as mandated by Congress in the 1999 Satellite Home Viewer Improvement Act (SHVIA) "should have a significant and positive effect on competition;" and 2) that "increased competition is the best way to keep cable rates reasonable." About 3 million (2.7) *net* new subscribers were added to the U.S. DBS industry in 1999, with total growth of about 400% since the end of 1994, according to SkyTrends. Recent DBS subscriber projections are being revised (upward), in light of the passage of legislation authorizing delivery by DBS operators of local television stations in direct competition with cable operators. Market analysts are forecasting total DBS subscribers of about 23 million by

**Figure 43****DBS - Direct Broadcast Satellite**

Source: NAB

**Table 17****U.S. DBS Growth Estimates\***

Year End	Subscribers (in millions)	% Growth
1998	8.7	38.1
1999	11.4	31.0
2000	14.5	27.2
2001	17.7	22.1
2002	20.8	17.5
2003	23.7	13.9
2004	26.5	11.8
2005	29.1	9.8
2006	31.1	6.9
2007	32.9	5.8
2008	34.2	3.8
2009	35.2	2.9
2010	35.8	1.7

\*Projected estimates for 2000 - 2010.

Source: Tellus Venture Associates

2007. On average, the U.S. DBS market appears to be on track to pick up 3 million new subscribers annually, until reaching a total of about 30 million. In 1999, Hughes' DirecTV and EchoStar's Dish Network both signed up record numbers of new subscribers. DirecTV added 1.6 million new customers, and EchoStar added 1.4 million. Overall, the number of U.S. DTH households of satellite TV services in the United States, became cash flow positive late in 1999. Echostar Communications Corp. [DISH Network], could cross the same threshold within the next year or two, according to Steve Blum, President, Tellus Venture Associates.

To sustain subscriber growth, interactive video services hold unique possibilities for the DBS industry, in addition to gaining an equal footing with cable in offering local TV stations. Cable has profited handsomely from being able to offer local stations since beginning operations in the 1970s. Authorizing the carriage of local TV stations is likely to sustain the accelerating growth of the DBS industry. By early 2000, already about 40% of DirecTV's subscribers had opted to pay a \$5.99 monthly fee to receive local TV channels, evidence of the demand for local TV stations by consumers as a video service offering. In today's merger-conscious

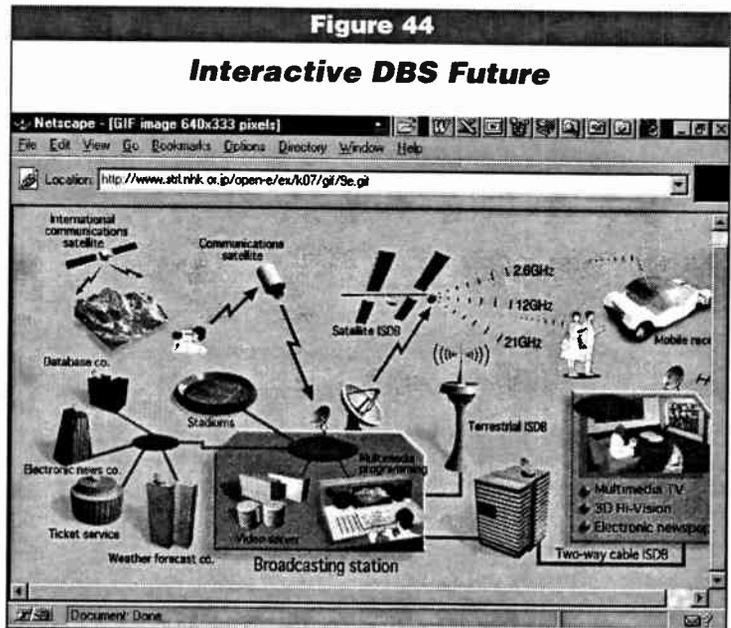
business environment, the DBS industry is not immune to potential structural shifts or future business realignments. Industry analyst Mickey Alpert (Alpert & Associates, Washington, DC) suggests that AOL's take-over of Time Warner could be a wake up-call, in that DirecTV and/or EchoStar may soon be ripe acquisition targets. According to Alpert, it would not be surprising if either venture was bought by a telephone company "at a very attractive price."

### DCC - Digital Compact Cassette

A cassette format developed by consumer electronic manufacturer, Philips that records CD-quality digital music on small cassette tapes that are compatible with existing digital and analog cassette tape systems. DCCs also have the ability to be used to encode descriptive information in digital that can be reproduced as text with appropriate decoders. In contrast to Digital Audio Tape (DAT) recorders, which have not gained consumer market acceptance, DCC players also can be used to play existing analog cassette tapes. This is a critical advantage as a significant amount of prerecorded music sales are on cassette tapes creating an immediate need for compatible DCC players. Another feature of DCC machines is the incorporation of an LCD display featuring the song title and artist. (See LCD)

### DC Power

Direct Current (DC) is one of two fundamental types of electrical power; the other is alternating current (AC). Batteries produce DC. Utility companies deliver 60 Hz AC to almost all users in



Source: NHK

**DCT - DeepSee**

the United States. Electronic devices need DC power. A converter changes the AC power to DC power for use by electronic equipment. Some appliances may not convert the AC into DC; for example a simple toaster may not. All devices that have electronic controls make the conversion, or use batteries. (See AC)

**DCT - Discrete Cosine Transform**

A set of mathematical manipulations that generates information describing the signal being processed. The description is in a form such that important information can be distinguished from less important information. Compression, by throwing away information that will not be missed when the signal is reconstructed, can be more easily accomplished after this transform is performed. DCT is a step in the process of both JPEG and MPEG compression algorithms. (See JPEG, MPEG)

**Debugging**

The process of detecting, diagnosing and correcting faults, flaws or anomalies in computer system circuitry, computer management software, program applications, databases, or other related hardware or software systems.

**Decoder**

Any electronic device used to reconvert or translate information from one established protocol or standard such as digital to another form such as analog. In computer and digital communications systems, digital decoders could be used both internally and externally. Inside a computer, digital bits are converted into text words on a display screen using a particular word processing application program. Decoders also are used in video distribution systems such as interactive TV, cable or new telephone-based broadband networks in which subscriber set-top boxes are used to decode or unscramble video channels to provide access to subscribers or those ordering PPV events. Other types of digital decoders are used to reconstruct error-protected coded signals so that information removed in compression or actually lost or damaged bits can be recovered or restored to the original form of the signal.

**Decryption**

Decryption is the process of restoring or reversing an encoded or encrypted signal to its original form. Encryption involves modifying, rearranging or scrambling a signal such as a pay-TV channel through the use of an algorithm designed to make the source material (audio, video, text, etc.) unable to be heard, viewed, or interpreted by an unauthorized recipient. (See Encryption)

**Dedicated Line**

Phone industry terminology for a telephone line that has been leased by a specific customer (usually a business) for exclusive use of the line for its own communications needs. Dedicated lines often are leased to provide an easy connection from one building to another to link offices within the same company.

**DeepSee**

A 3D video technology currently in development that would enable two-dimensional video material to be converted and made compatible with newer 3D transmission technology. DeepSee technology, developed by Dynamic Digital Depth (DDD), is designed to enable cable operators, broadcasters, or other video content providers to overcome the existing lack of 3D video content by converting new and existing two-dimensional video programming into a high-quality 3D format. New 3D video material, as well as upconverted 3D programming content would require decoding by a new generation of advanced digital set-top boxes. Reportedly DDD is the only

company, at present, that can provide video content providers with options for 2D or 3D programming which consumers can control on-demand via a remote control unit.

**Defrag (abbreviation for Defragment)**

A term referring to a process for making more efficient use of computer hard drive space. This is necessary because as files continually are stored and deleted, small non-contiguous "sectors" or "clusters" of the hard drive become unusable. "Defragging" the disk rearranges the information stored on the drive into larger contiguous blocks, typically freeing up previously unusable space.

**Demarcation Point (Demarc)**

The point of separation between telephone company communication facilities and those of a business or residential subscriber. It refers to the physical interconnection point where legal jurisdiction is transferred from the phone company to a subscriber or user so that servicing of terminal equipment, protective apparatus, or wiring at a subscriber's premise is the responsibility of the user.

**Demodulation**

When a baseband radio frequency (RF) signal is modulated, it essentially is allowed to piggyback on a carrier wave for transmission to receiver destination. Demodulation is the process of separating the signal from the carrier wave for reception by a specific electronic device such as a radio. Modulation and demodulation are used in transmitting commercial radio and television broadcasting signals, as well as in many other communication services that are transmitted using radio waves.

**Demultiplexing (DeMUX)**

The process of separating or recovering the individual signals or channels that had been combined into a single multiplexed signal for transmission. (See Multiplexing)

**Dense Wave Division Multiplexing -DWDM**

A more recent type of digital photonics technology where data transmissions are sent as multiple optical signals through a single fiber optic line. Dense wave techniques use several laser light sources and detectors operating simultaneously at different color light wavelengths.

**Density**

The amount of information stored within a defined length on a magnetic or optical medium. (See Bit Density)

**Deregulation**

The reversing, easing, or elimination of previous regulatory policies or laws that generally have become outdated, outmoded, or unduly restrictive as a result of changes in business market conditions, competitive structures, and/or technical advancements since the regulations were first enacted. Most recently, the Telecommunications Act of 1996 deregulated many segments of the communications industry allowing for more direct competition among different businesses and industries. For example, cable operators will be allowed to provide telephony services, local phone companies may offer interactive video, and long-distance companies, including notably AT&T, may provide local telephone services, among other major reforms. (See Telecommunications Act of 1996)

**Desktop Publishing (DTP)**

Computer-based hardware systems including peripheral devices, and specialized publishing

## Desktop Videoconferencing - Digerati

oriented software designed to easily create, compose, and manipulate various word processing text files, graphics, and other special effect or design elements into publication layout formats for newsletters, brochures, magazines, or reports.

### Desktop Videoconferencing

The process of using a personal computer with graphics capabilities and desktop cameras to enable videoconferencing among two or more parties in remote locations. From the computer, this connection can be transferred over standard analog telephone lines. Digital links, like ISDN, usually provide higher transfer rates of information with less loss of signal. Higher transfer rates translate into a sharper picture that has the ability to refresh itself more often, thereby giving the receiver a more continuous, less static picture. Through the use of desktop videoconferencing, virtual offices can be created where an employee has the flexibility to work from any location as long as he or she is connected visually to the main office and/or clients. (See CU-SeeMe, ISDN, NetMeeting, Teleconferencing, Videoconferencing)

### Device Manager

Refers to a feature of a computer's operating system that allows the user to view and change the settings or "properties" of the various computer devices such as printers, modems, disk drives, etc. (See Operating System, Windows)

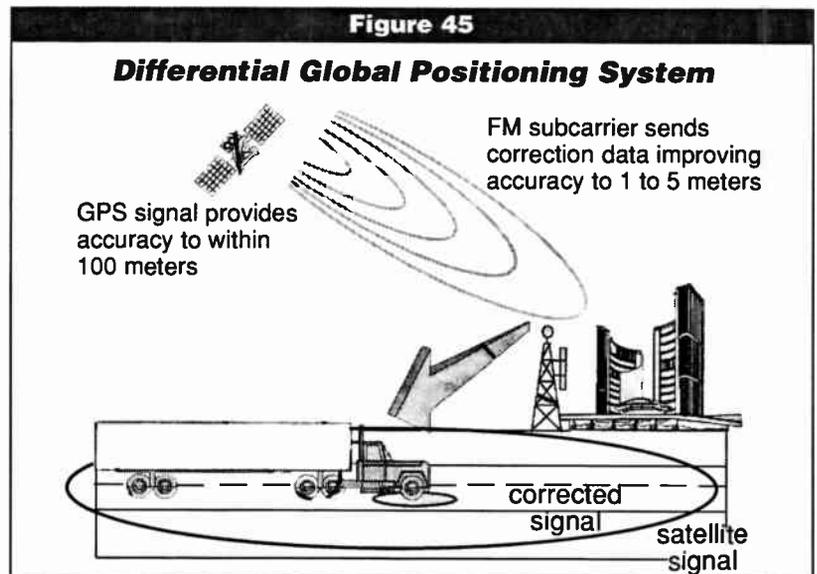
### DGPS - Differential Global Positioning System

DGPS is a technique for providing enhancements to existing data that is available from the NavStar Global Positioning System. GPS is a network of ground stations and spacecraft operated by the U.S. Department of Defense, which are used to provide precise position, location and time information to users worldwide. Commercial DGPS services are being

developed for customer applications that encompass a range of business purposes such as truck fleet tracking to street navigation systems in cars. DGPS relies on the existence of a "correction signal" which is generated at a standard GPS receiver location. The position of the sites has been established precisely using non-GPS techniques such as surveying. The correction signal is valid for any GPS-user within the vicinity up to about 100 miles of the so-called reference receiver. Correction information can be transmitted to DGPS end-users using the subcarrier datacasting capabilities of FM radio stations or via other last-mile carrier means. (See GPS)

### Digerati

A variation of the term "literati" which has been used to describe people who are knowledgeable about literature. In the case of "digerati" the term refers to people who are relatively knowledge-



Source: NAB

able about computers, systems and related software, hardware tools and functions (i.e., are "computer literate"). (See Webhead)

**Digital**

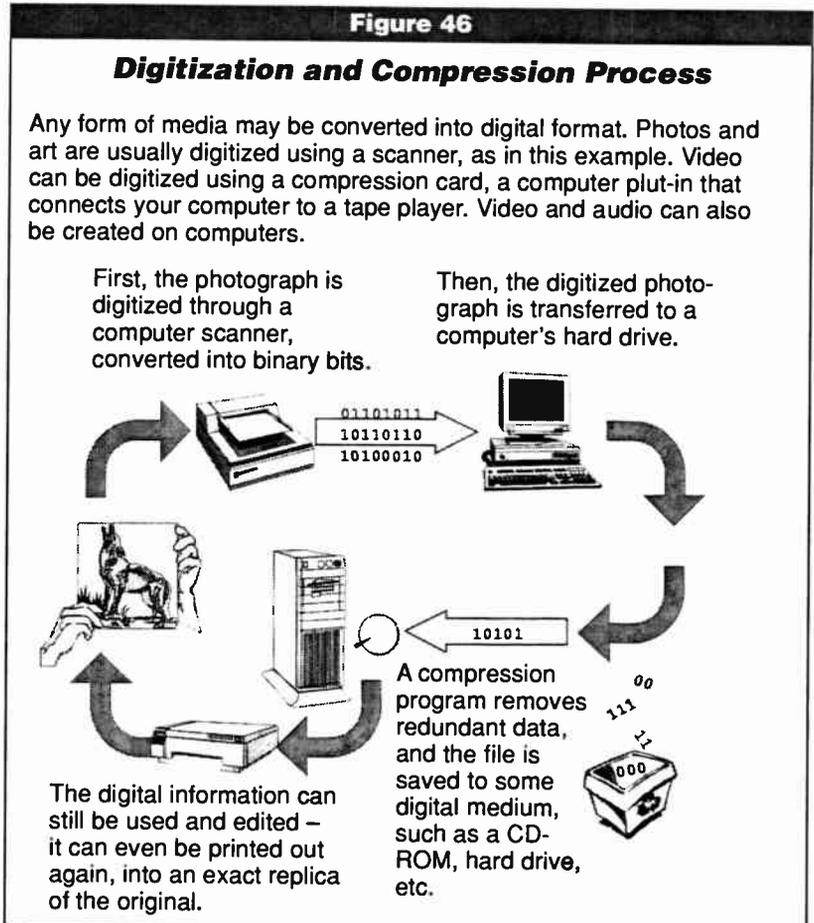
Digital formats, digital systems, and digital equipment all rely on the same fundamental operating condition which is that all information processing, transfers of signals, storage of information, and related functions are represented in numerical code or form. But not just any numerical form. Due to its relative simplicity, digital computers intentionally were designed to function by corresponding to the two states of transmitted electrical pulses — namely, power is either On or Off. On and off conditions could be represented precisely by using two numbers: zero and one. This set of two digits is also a particular numbering system called binary

("bi" meaning two, and "nary" loosely meaning numbers). Digital information is a precise way of expressing different forms of information that can be quantified in some way. How precisely the information is quantified, or by what technique(s) goes a long way toward determining how close a digital signal such as a video clip is compared to the original 35mm film.

Digital formats are rapidly replacing analog signal formats (tapes, records, film) which really were just an earlier form of information technology which seeks to replicate real-world sights and sounds using a continuous waveform. Because digital systems require the conversion of images, audio recordings, or voice conversations into numerical code some things get lost in the translation, either intentionally as with compression, or unintentionally due to a variety of degradation errors. Most newer electronic formats, CDs, CD-ROMs, computers, wireless PCS, and future formats for HDTV, DAB are digital. Digital's advantages are that it's simple and numerical, thus errors can be mathematically predicted and therefore reduced and/or corrected. Digital is also flexible, can be manipulated, encoded, lends itself to various transmission methods, and is less subject to degradation than traditional analog signal technology.

**Digital Camera**

Refers to a camera that stores images in digital form rather than on film. Once the pictures have



Source: NAB

## Digital Certificate - Digital Divide

been taken, they can be downloaded to a computer or printed out on a special printer. The quality of images taken by a digital camera is limited to the amount of memory that the camera is able to use in storing the image. One advantage of using a digital camera is that users do not have to use a scanner to input photos into a computer; rather, they can simply download the images directly into the computer and then manipulate them however they wish.

### Digital Certificate (also called Digital ID's)

An entity (typically a company) that issues digital certificates to other organizations or individuals to allow them to prove their identity to others. A Certificate Authority might be an external company such as VeriSign that offers digital certificate services, or they might be an internal organization such as a corporate MIS department. The Certificate Authority's chief function is to verify the identity of entities and issue digital certificates attesting to that identity. (See Authentication)

### Digital Copyright

An increasingly complex and difficult issue in the digital age for all creators, producers and originators of intellectual property content from authors, newspapers and film studio to music composers, video programmers and artists of all kinds. The seminal advantage of digitization is its ability to offer relatively easy access to an enormous wealth of digital information/material content. This accessibility also is its biggest liability in terms of the ease of unauthorized distribution and duplication on a mass scale. The Digital Millennium Copyright Act is an effort to begin to address the interconnected issues of consumer right to access and traditional copyrights for content originators.

### Digital Data Units of Measures

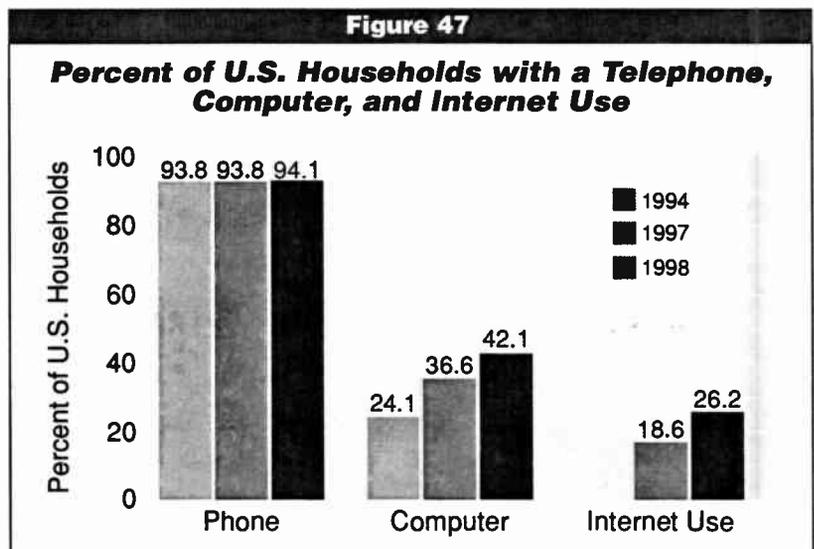
The following units of measure are used to define digital computer data storage and digital transmission channel or network capacities. (See Binary, Binary Numbering)

### Digital Divide

A recent term being used to represent the gap between those in the population who have access to computers and the Internet and all this signifies, and those who do not. Computer literacy is significant, as are all of the other benefits of the Information Age. It is critically important to share these benefits with all citizens, not just those who can afford the price of the technology. A recent poll of working adults

conducted by Rutgers University and the University of Connecticut revealed that a majority of U.S. workers (68%) use a computer everyday in some capacity at work, and a majority have access to one at home as well. Twenty-three percent of workers said they learned to use computers at

Figure 47



Source: NTIA, "Falling Through the Net: Defining the Digital Divide", July 1999

work, and 26% indicated they learned these skills at school. But a majority of today's computer literate workers taught themselves or learned from a friend or acquaintance. Results from the poll underscored the large socioeconomic difference (i.e., divide) between the "technophiles" having high digital computer literacy skills and the "exiles" with only minimal skills. The study concludes that the exiles want to be part of the digital economy, but don't have the economic means to buy their way into the market. As a result, the lack of access, financial resources, and skillsets translate into a future of low-paying job prospects that are not part of the e-commerce markets of the future.

**Digital Media**

(See Electronic Media Market)

**Digital Signatures**

Electronically coded messages that accompany text messages, identifying the author of each document or component. For example, all ActiveX controls transmitted over the Web are digitally signed by their creators.

**Digital Versatile Disk**

(See DVD)

**Digital Video Broadcasting**

(See DVB)

**Digital Video Disk**

(See DVD)

**Digital Video Effects**

(See DVE)

**Digital Watermark**

An invisible identification code permanently embedded into data as a means to prevent piracy or fraud.

**DIN - Deutsche Institut fur Normung**

A long-established standards-setting organization that establishes technical standards in Germany for electronic and industrial products. Many of these standards have been accepted in most industrialized nations and many electronic system components employed outside the U.S. are built to DIN standards. Certain DIN standards have become accepted worldwide, such as those for the dimensions of cable connectors, which are often referred to as DIN connectors.

**Diode**

Diodes are devices that for all practical purposes allow electrical current to flow in only one direction, for example from positive to negative or negative to positive. An arrangement of diodes can be the basic tool for converting an AC electrical power signal to DC by rearranging the negative and positive pathways of the input current so the output currents have the same polarity. Some diodes also emit or detect light via a more complex, but related process.

**Dip Switch**

A series of small switches that provide for manual alterations to the way a computer board or other electronic control board functions. These switches function as either on or off, and as a

## DirecPC - Directional Antenna

result, a series of dip switches linked together can create a binary code, which a computer can interpret. In RF generators, different binary codes represent the frequency of the carrier wave for a modulated signal thus setting a specific dip switch determines which radio frequency will be generated.

### DirecPC

DirecPC is a commercially available two-way satellite Internet service offered by GM/Hughes Electronics. Hughes has unveiled a new high-speed DirecPC Internet initiative in early 2000, two years before it was originally expected. The new enhanced DirecPC service is being readied for launch by Q4 2000 and will offer two-way Internet satellite services, with "an AOL component" which is anticipated to help spur growth. Hughes estimates that the expanded DirecPC service will have 1.2 million subscribers by 2003. At that time, Hughes plans to launch its second-generation Ka-Band satellite service platform, Spaceway, which is being specifically designed to offer two-way satellite Internet services.

### DirectDraw™

Refers to Microsoft's registered trademark of a system developed by Intel that transfers the processing of video signals from the CPU to the computer's video adapter. For example, DirectDraw is often used by TV tuner cards that can be installed in PCs allowing users to watch TV programs on their computer while they work. DirectDraw can also be used to make computer games display complex graphics more quickly and smoothly.

### DirecTv

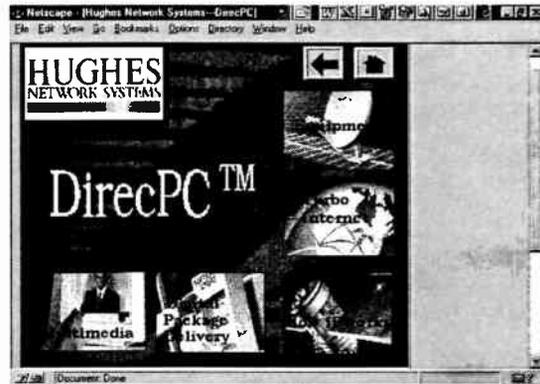
(See DBS, DSST™, DTH)

### Directional Antenna

A commonly used terrestrial or ground-based antenna system that propagates signals toward a specific direction or directions. This type of antenna system is useful for AM radio stations seeking to extend signal coverage toward more populated areas in a market. If licensed as a

Figure 48

### DirecPC



Source: NAB

Figure 49

### Continuing Convergence



directional AM station, signal strength can be shaped or directed to cover only certain geographic areas. But these directional signals cannot interfere with other stations on the same channel (co-channel) or on adjacent frequency channels. In general, if interference occurs, a particular AM station may have to reduce power and/or adopt the use of a directional antenna pattern to avoid the interference, especially at night.

### Disc

In common usage, there are disks, and then there are discs. The two generally represent the same type of digital storage function but aren't used interchangeably. The primary distinction relates to the type of medium used for digital information storage. A computer device that magnetically stores information is a disk such as a hard disk drive or a floppy disk. Newer optical technologies such as CDs, CD-ROMs, laserdisc, or other optical storage technologies appear to prefer to use "disc." While bits are bits, disks are not discs.

### Discontinuity

An electrical pathway that has been disturbed or altered in some fashion which interrupts the flow or transfer of a signal.

### Discrete

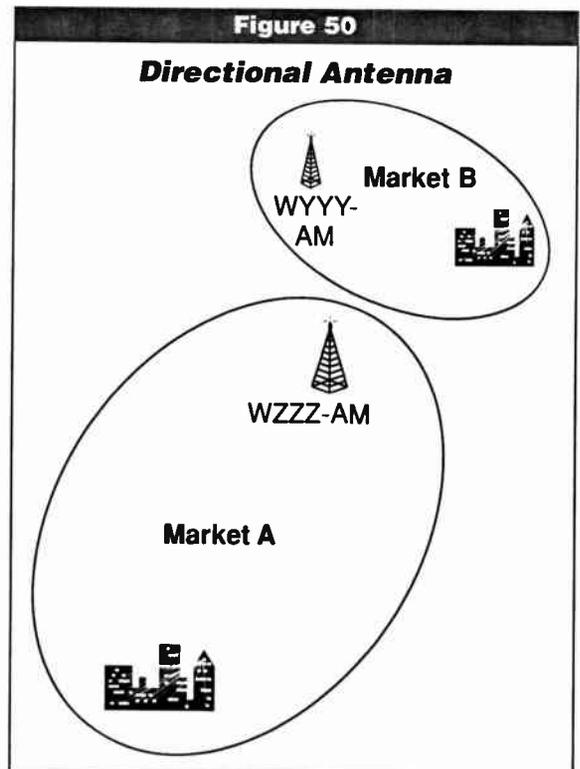
In communications, this is used as a descriptive term to denote a precise or contained environment, or quantity. In a telco T-1 line, there are 24 discrete or totally separate channels in a single line. In converting audio music information into digital form, discrete samples of the continuous analog signal are extracted and converted to digital for recording or transmission.

### Dish

Common slang for parabolic satellite antennas which along with decoder and other electronics are part of a satellite earth station facility. Some dishes can perform both uplink and downlink functions, but most often the term is used for antennas being used by consumers to receive satellite video entertainment programming. Dishes include the older, larger "back-yard" television receive-only (TVRO) antennas measuring 3 - 5 feet and used for C-band reception, and the smaller Ku-band antennas able to receive digital DBS or DTH services measuring 18 - 24 inches in diameter.

### Disintermediation

A term that refers to the removal of the "middle man" or the intermediaries typically involved in commercial transactions. It is commonly applied to Internet-based businesses that use the Web to sell products directly to customers rather than going through traditional retail channels. Disintermediation theoretically allows companies to lower their prices and run their businesses more efficiently. (See E-commerce)

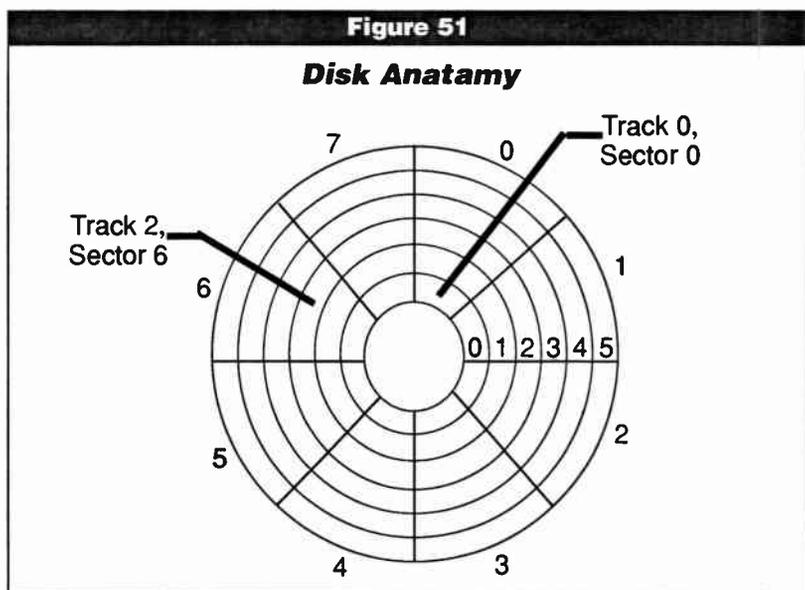


Source: NAB

**Disk - Distance Learning****Disk**

An electronic storage device for digital information from which data can be retrieved, augmented, or deleted as needed. Magnetic hard disks used in computer operations are organized or divided into tracks and sectors to facilitate and maximize storage and accessing functions. In new multiple platter systems, such as RAID or in hard drives with multiple disks, the magnetic heads used to write on the disks are lined up on similar

tracks and sectors on each platter. Electronic pointers are inserted at the end of a sector to indicate where additional data is stored in another sector. (See RAID)



Source: NAB

**Disk Cache**

A buffer area in computers used for temporary storage of information being transferred in to or out of a hard disk or floppy disk. Such input/output (I/O) transactions are the most time intensive of all computer functions, reducing computer efficiency dramatically. Disk cache accumulates data into bundles before sending it to storage and can retrieve the next logical piece of information from a hard disk. Another type of disk cache keeps recently accessed disk information in memory, reducing the amount of time the CPU has to wait to retrieve this information if accessed again. (See Cache, I/O)

**Display**

An electronic output device that visually reproduces information from a computer or television receiver. Some displays provide for interactivity in that an individual can access desired information through the use of a touch screen menu. Displays vary in the quality of resolution from a standard 525-line NTSC monitor with a 4 x 3 aspect ratio to HDTV which, as standardized by the FCC, will provide 1125 lines of resolution with a 16 x 9 aspect ratio. Other displays include flat panel displays designed for laptops, matrix displays, and wall panel displays. (See Flat Panel Display, Graphics Adapters, HDTV)

**Dissolve**

A transition technique used in video editing and live broadcasts that gradually replaces one on-screen video image with another. As the visual value of the first signal dissipates, the value of the second increases until it becomes 100% of the picture. Dissolves also are used in 35mm films for montage scenes typically presenting the illusion of the passage of time or a memory.

**Distance Learning**

The process of using telecom networks, satellite video and computer technology to enable teachers to interact live, in real time, with students located in distant locations across town, state,

region or country. Distance learning has rapidly grown as it is viewed as a major public benefit that justifies the rapid deployment of advance telecommunications technologies. (See Digital Divide)

### **Distortion**

Alteration or deviation of a signal with a typical example in broadcasting being the overmodulation. Distortion from overmodulation may show up in overly bright luminance causing lettering used in commercial segments to become so "hot" that the information cannot be properly interpreted at the receiving end. In digital voice or data transmissions, distortion interference can disrupt the integrity of the signal causing misinterpretation of the signal at the receiving end.

### **Distributed System**

In a distributed network system, various parts of the network have specified functions or capabilities; there is no centralized hub directing the whole system. True client/server architectures are examples of distributed data systems where processing takes place both at the client workstation and the main file server. (See Client/Server, Novell)

### **Divestiture**

Typically, refers to the court-ordered break-up or divestiture of AT&T in 1984. This was the result of lengthy litigation against AT&T based on its anticompetitive practices stemming directly from its monopoly status as state-sanctioned telecommunications provider in the U.S. AT&T provided both long-distance and local telephone services and was the product manufacturer for all its equipment. U.S. District Court Judge Harold Green decreed that, as of January 1, 1984, AT&T would divest itself of its local telephone operations, which became the seven Regional Bell Operating Companies. (See RBOC)

### **Divx™**

Short for Digital video express, a DVD-ROM format that was promoted by several large Hollywood companies, including Disney, Dreamworks, Paramount and Universal. A subscriber-based service that is connected to the home through a telephone line, Divx movies were playable only during a specific time frame - typically two days. As soon as the customer begins playing a Divx disc, the countdown is activated. While the service was, for a short time, seen as a viable alternative to video store rentals, it was always handicapped by the fact that the Divx format was not backward-compatible with current DVD-ROM players. This means that current DVD player owners needed to buy a new Divx player to play Divx titles. As of June 16, 1999, Divx is no longer selling players or adding accounts to their service. Current Divx owners will be able to play Divx discs through June 30, 2001, and they'll be able to play standard DVDs for the life of their player. (See DVD)

### **DJ - Disk Jockey**

Traditional radio station on-air personalities that introduce and discuss records being played on the air, and typically provide a wide range of other local and timely information of interest to audiences. With the introduction of music videos on television and cable, MTV created its own offshoot term for their announcers, calling them VJs for Video Jockeys.

### **DLL - Dynamic Link Library**

A technique used extensively by Microsoft that uses a collection of small programs that are activated only when needed by the larger programs to which they are associated. In other words, DLL files allow a very large program such as Microsoft Word to load into the computer's

**DM - DoCoMo**

memory without loading all of the possible options that might be needed at any given time. If users choose to print a document, Word finds the printing DLL files and loads them into memory. Once the printing is done, the memory space taken up by the printer DLL files is cleared. This approach makes for much more efficient use of any computer's limited memory resources. Some DLL files can be used by many programs at the same time. On the other hand, if a DLL file is accidentally deleted, lost or corrupted, it's very likely that certain parts of Windows applications will have difficulty running. DLL files usually end with the extension .dll, .exe, .drv, or .fon.

**DM - Delta Modulation**

A technique used in the telecommunications industry for converting analog voice signals to digital form for transmission.

**DMA - Designated Market Area**

Nielsen Media Research's defined areas for local television viewing markets. DMAs are non-overlapping geographic markets. Each county in the continental United States is annually assigned to a single DMA based on Nielsen's local audience estimates called the Nielsen Station Index (NSI). DMAs are frequently used for the planning, evaluation, and the buying of commercial time based on television audience estimate data. DMA markets are used in determining the share of local viewing achieved by commercial television stations serving metro areas and/or local DMA television markets.

**Docking Station**

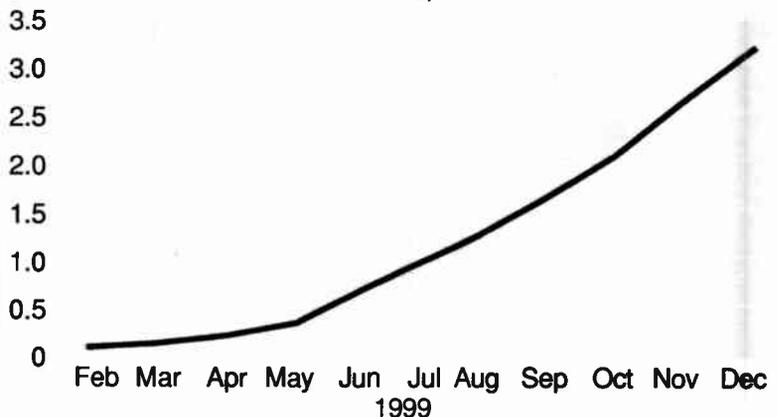
Electronic platform equipment allowing a laptop to be plugged into the device enabling it to be quickly connected to a standard computer monitor, full-function keyboard, mouse or pointing device, and other computer peripheral equipment such as printers, fax machines, or scanners. Docking stations are used to create a readily accessible workstation for users needing a laptop computer for the mobility but rapid set-up and ergonomic comfort when working at home or in an office for long periods of time. Most mobile computer manufacturers make docking stations for their brand of laptops, but there is no standard docking station architecture. As a result, typically the only vendor from which a docking station can be acquired to ensure complete compatibility is the manufacturer of the laptop. (See Ergonomics, Port Replicator)

**DoCoMo**

Well-known nickname of Kouji Ohboshi, Chairman of NTT's Mobile Communications Network, the driving force behind the skyrocketing growth in NTT's cellular phone service in Japan. Intense demand has prompted NTT DoCoMo to accelerate development of third-generation (3G) mobile wireless technology. The company plans to roll out 3G cell phone

**Figure 52****Japan's NTT i-Mode - Wireless Explosion**

*Subscribers to NTT i-Mode service, in millions*



Source: NTT

technology in early 2001, years ahead of the wireless technologies in use in the U.S. or Europe. Delivery of high-speed Internet services is the primary motivation for accelerating the rollout of 3G technology which make possible the delivery of live video and interactive games over mobile phones and other portable wireless devices. (See 3G, Internet Appliances, Wireless Internet Devices)

### Dolby

Named for its creator, Ray Dolby, Dolby sound was one of the first stereo systems developed for use in movie theaters. Dolby is currently available in updated surround sound capacity in certain home entertainment systems. Newer movie theaters have enhanced the sound quality of their theaters by installing digitally reproduced surround sound formats such as THX™ (developed by Lucasfilms, LTD). The ultimate goal of these newer digital systems is to give the viewer the feeling of being surrounded by the action.

### Domain Name

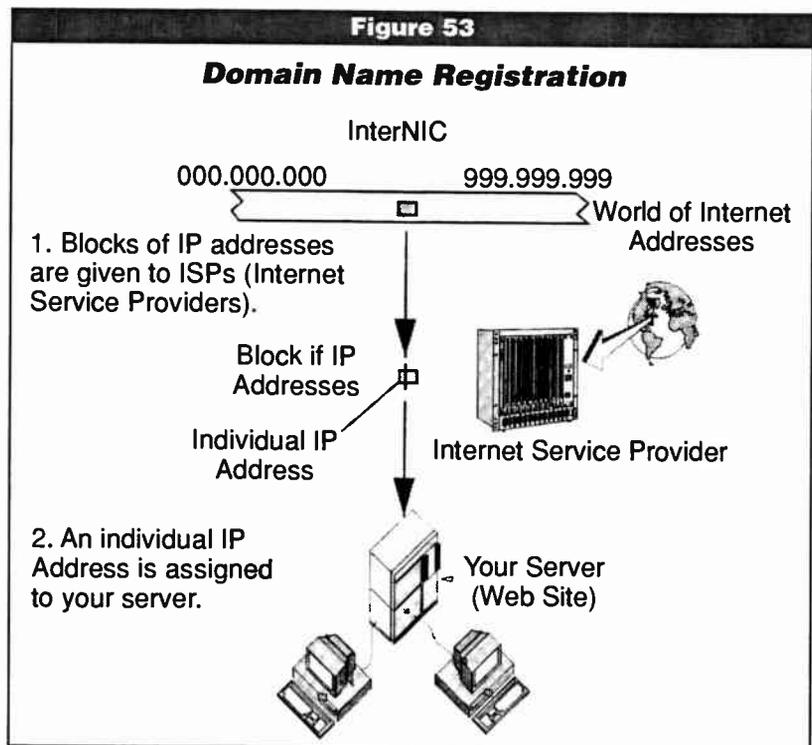
A naming system that identifies each unique Web server on the Internet (e.g., [www.nab.org](http://www.nab.org)). When a user types in a domain name into the location box of a Web browser, a "Domain Name Server" (DNS) processes the request to match the domain name with its associated address on the Internet. (See Dot.com, Internet, InterNIC, Round Robin DNS)

### Dongle

Known also as a "hardware key," a dongle is a small electronic device about the size of a matchbox used by some software manufacturers to prevent unauthorized/unlicensed use of their software. The device is usually attached to a computer's parallel port and contains certain authentication settings that verify whether a particular software is acceptable (i.e., not pirated) and thus able to be run on that system. Use of hardware keys or dongles make it nearly impossible for users to install illegally acquired software as the software will not run without an appropriate dongle attached to the machine. (See Parallel Port)

### DOS - Disk Operating System

DOS is a type of personal computer operating system commercially developed by IBM and used in all later IBM "clones" or IBM-compatible computers. DOS was created by a small computing company in Seattle as QDOS (Quick and Dirty Operating System) and developed further by



**DoS Attack - Download**

Microsoft and Bill Gates. Gates sold QDOS to IBM, but retained the intellectual property rights of the operating system for Microsoft. DOS 7.0 is the most current version of the system operating software and is embedded in Microsoft's graphics oriented front-end software, *Windows 95*. (See GUI)

**DoS Attack - Denial of Service Attack**

An attack by hackers or computer troublemakers that is designed to shut down a computer network by flooding it with useless, redundant traffic. One of the largest DoS attacks in Internet history occurred over several days in February 2000 when popular website such as Yahoo, eBay, CNN.com, and Amazon.com experienced outages caused by an intentional overload of traffic to their sites. In several cases, the instigators were able to flood their targets with more than 10 times the traffic their systems were designed to handle. While there are software measures that can prevent these types of attacks, there are always new strategies emerging for shutting down large computer networks. (See Hackers, TCP/IP, Internet)

**Dot.com**

Popularized term that has come to refer to the exploding number of commercial sites on the Internet offering goods or services as an extension of their present line of business. Also dot.coms provide technical systems, business support, or advisory services to companies looking to establish or build a presence on Internet/Web. The term is derived from the original "naming protocol" established to classify or identify different types of Internet domains. The protocol requires the use of a period and a specific three-letter extension to identify a domain. These broad classifications usually have been called "top-level domains" and include the following categories: .com (for commercial business providers), .edu (for educational institutions), .gov (U.S. government agencies), .mil (U.S. military), .net (network operators), and .org (for non-profit organizations, or other groups).

**Dot Pitch**

Dot pitch is a measurement technique referring to the distance (in millimeters) between the pixels or visual dots that make up the image on a video display screen or PC monitor. It is one of the most common ways to judge the visual quality of a computer monitor. Typical dot pitch measurements range from 0.28 mm to 0.51 mm, but large presentation monitors may have technical capabilities to range up to 1.0 mm. Basically, the smaller the dot pitch or space between the pixels in a video display, the crisper the image and higher visual quality. A dot pitch of 0.31mm or less provides a relatively sharp image for displaying text. High-end video graphics monitors and video game players often use dot pitches at 0.25mm or less.

**Downlink**

Refers to the transmission of a signal from a satellite to an earth station receiving antenna. Specific downlink frequencies are established for satellites operating in various satellite bands (C-band, Ku-band, etc.) Downlinks are distinctly separate from uplink frequencies that are used for transmitting originating signals from earth stations to a satellite. Possible interference is greatly reduced by having satellite uplink and downlink frequencies typically located at different ends of their assigned spectrum bands. For example, Ku-band DBS satellites operate with uplink frequencies at 17.3 - 17.8 GHz and downlink frequencies at 12.2 - 12.7 GHz. Satellite services are identified commonly by their downlink frequencies. As a result, DBS services are described as Ku-band services at 12 GHz.

**Download**

Generally means to transfer information from an outside source or a peripheral device into computer memory. Outside sources might include the Internet, faxes delivered via modem, and peripherals could include floppy disks or external CD-ROM.

**Downtime**

Usually refers to the time a system is out of operation for any reason, usually for repairs, maintenance, system upgrading, etc. Computer services are sometimes rated based upon the percentage of downtime experienced by the system.

**DPCM - Differential Pulse Code Modulation**

(See PCM)

**DPSK - Differential Phase-Shift Keying**

A type of signal modulation that is a variation on PSK, where the system is organized to recognize whether there was a difference between two adjacent bits, and if there is a change (say from 0 to 1), then the shift in signal phase is transmitted. If no difference is detected, no shift in phase is required. (See PSK)

**DQPSK - Differential Quaternary Phase-Shift Keying (4 PSK)**

A variation of DPSK in which two digital bits can be modulated rather than just one, so twice the amount of signal information can be transmitted using four different phases — for example: 90, 180, 270, and 360 degrees representing four different bits, two 1's and two 0's. A further variation is 8 PSK, where 8 discrete signals can be modulated using any of eight established phases allowing four times the amount of information to be transmitted as a regular phase shift key modulation scheme. (See PSK)

**Drag and Drop**

A computer operation that came into being with the use of a “mouse” as a pointing device and the introduction of intuitive graphics-oriented “front-end” software such as Windows from Microsoft. Using a mouse or other pointing device, drag and drop is the process of selecting a picture icon, a portion of text, or some section of a document and dragging it to relocate it to another file folder, open document, or section in the computer's filing system. Graphical user interface (GUI) software was first available in Apple's Macintosh system and Mac users enjoy more types of drag and drop capabilities such as repositioning files within organizational “folders.” Mac drag and drop functions also include the ability to open floppy disks or CD-ROMs or delete files merely by dragging a file icon over to another graphical icon representing a trash bin. Microsoft's *Windows 95* added many additional capabilities that more closely matched Mac's original drag & drop functions. (See GUI)

**DRAM - Dynamic Random Access Memory**

The principal memory storage device in PCs and one of two main types of computer RAM. DRAM stores information via tiny transistors often capable of providing 8 Megabytes or more of operating memory. DRAM memory constantly requires being electrically refreshed or recharged or memory will dissipate. Any form of RAM is temporary storage where instruction sets and data will be lost if power is interrupted. (See RAM)

**Driver**

A type of computer software providing a specific communication link between a peripheral device such as a printer and the CPU. Various software drivers enable a range of peripheral devices to communicate with the central microprocessor, and are usually installed (i.e., loaded into a computer) from either a floppy disk or a CD-ROM. Driver software is used to provide instructions to appropriate connection “ports” for particular peripheral devices, and provide translation for incompatible instructions. Driver software can become corrupted or lost and requires reinstallation using the original CD-ROM or floppy disk.

**Drop - DSL****Drop**

In the cable industry, a drop is the portion of the cable network that connects a subscriber's home from the feeder network. A drop line extends from the cable "tap" to a subscriber's set-top converter box. Drop lines may be aerial or buried underground depending upon the method of construction used. (See Cable)

**DSL - Digital Subscriber Line**

A digital technology that significantly increases the digital capacity of ordinary twisted-pair copper phone lines. DLS provides high-speed data connections (up to 6 Mbps) over local loops by dividing the phone line into two segments - one for voice, modems, faxes, etc., and the other exclusively for digital data. The data channel runs parallel, and does not interfere, with the regular voice channel, thus users can make phone calls or send faxes while connected to the

**Table 18****DSL — Theme and Variations**

<b>ADSL</b>	The widely recognized DSL flavor is Asymmetrical DSL (ADSL) which is available in two modulation schemes: Discrete Multitone (DMT) or Carrierless Amplitude Phase (CAP). ADSL and its variants can share the same line with regular voice service essentially because they utilized higher frequencies than voice channels, but require a splitter at the customer's premises to separate the voice from the ADSL data traffic.
<b>Universal ADSL</b>	Also referred to as G-lite, ADSL Lite, or Splitter-less ADSL, eliminates the splitter requirement, but other phones connected to the line may have to plug into low-pass filters to isolate them from the ADSL frequencies.
<b>CDSL</b>	Consumer DSL is an asymmetric service that supports regular 56 kbps (V.90) modem connections, if full ADSL service is not available in a particular geographic area. RADSL: Rate Adaptive DSL adjusts transmission speed based on signal quality.
<b>IDSL</b>	ISDN DSL provides ISDN speeds, but does not support regular voice service and does not use the switched telephone network as does ISDN.
<b>HDSL</b>	High Bit Rate DSL is the most widely-used variant of DSL technology, providing T1 speeds over existing twisted pair without requiring the additional provisioning required for setting up T1 circuits.
<b>SDSL</b>	Single Line DSL is a variation of HDSL but only uses one pair of cables instead of two. Both HDSL and SDSL cannot share lines with regular voice channels.
<b>VDSL</b>	Very High Bit Rate DSL is expected to be used as the final drop from a fiber optic switching point to nearby customers. The extremely high capacity of VDSL would enable an office complex to have high-bandwidth services using existing copper wires without having to replace the entire infrastructure with optical fiber. Like ADSL, VDSL can share the line with the telephone.

Internet. The technology is geared to Internet access with its asymmetric architecture (faster downstream than upstream), and it's relatively short haul connection distance. Typically, DSL connections provide 512 kbps to 1.544 Mbps (T-1 rate) of downstream capacity and about 128 kbps upstream capacity. DSL is attractive to telecommuters and small- to medium-sized businesses as it provides a reliable, affordable means of maintaining a constantly available fast connection to the Internet, while not requiring a second line for phone and fax services. The availability of DSL service depends on the proximity of a user/client to the phone company's local switching office – and usually is limited to a three-mile radius. Unlike digital ISDN which uses the traditional switched telephone network, DSL provides “always-on” operation. At the telco central office, DSL traffic is aggregated in a unit called the DSL Access Multiplexor (DSLAM) and forwarded to the appropriate ISP or data network. There are many versions or “flavors” of DSL often represented as xDSL.

**Table 19**

**Symmetric DSL Service**

*Service Cannot be Shared with Voice Service Except VDSL*

Type	Upstream Rate(s)	Downstream Rate(s)	Line Pairs	Phone Cable Distance (feet in 000s)
HDSL	768 kbps	Same as Upstream	2	12
	1.544 Mbps (T1)	“	2	12
	2.048 Mbps (E1)	“	3	12
HDSL-2	1.544 Mbps (T1)	“	1	12
	2.408 Mbps (E1)	“	1	12
SDSL	384 kbps	“	1	10
	768 kbps	“	1	10
IDSL	144 kbps	“	1	18
VDSL*	26 Mbps	“	1	1.0 - 4.5

\* Able to share line with voice traffic.

Source: Bell Atlantic

**Table 20**

**Asymmetric DSL Service**

*Service Permits Line-Sharing with Voice Service*

Type	Upstream	Downstream	Line Pairs	Phone Cable Distance (feet in 000s)
ADSL	64 - 800 kbps	0.5 - 8 Mbps	1	12 - 18
ADSL Lite	64 - 384 kbps	1 - 1.5 Mbps	1	22 - 25
CDSL	128 kbps	1.0 Mbps	1	12 - 18
RADSL	128 kbps - 1.024 Mbps	0.6 - 7.0 Mbps	1	18 - 25
VDSL	1.6 Mbps	13 Mbps	1	1.0 - 4.5
	3.2 Mbps	26 Mbps	1	1.0 - 4.5
	6.4 Mbps	52 Mbps	1	1.0 - 4.5

Source: Bell Atlantic

**DS-0 - DTH****DS-0 - Digital Signaling - Zero Level**

Refers to the lowest level in a set of worldwide digital signaling standards for telecommunication transmission of voice signals using pulse code modulation. DS-0 signals are transmitted at a rate of 64 kbps.

Typically, DS-0 lines are divided into two segments: a 56 kbps portion for digitized voice traffic, and 8 kbps used for internal network signaling. When all 64 kbps capacity is used, the line is called a "clear channel." Newer standards for higher data rates for optical fiber networks have been established. (See SONET)

**Table 21**  
**Telephone Digital Signaling Standards**

Standards	Digital Data Rate
DS-0	64 kbps
DS-1	1.5 Mbps
DS-1C	3.15 Mbps
DS-2	6.2Mbps
DS-3	44.7 Mbps
DS-4	274 Mbps

Source: Bellcore

**DSP - Digital Signal Processing**

A specialized communication system that alters, enhances or filters continuous analog signals through a digitization process to produce more efficient transmission of signals. A wide variety of applications and products use DSP including faxes, modems, computer disk drives, mobile wireless cellular or PCS service, medical imaging technologies, and computer graphics, etc.

**DSS™ - Digital Satellite System**

Trade name for a satellite decoder and small 18-inch antenna system developed and sold under the RCA brand of consumer electronics manufacturer, Thomson. The DSS consumer equipment system was developed under an exclusive marketing agreement with DBS service providers DirecTV and USSB, guaranteeing DSS sales to the first 1 million DBS subscribers. (See DBS, DTH)

**DSU - Digital Service Unit**

Telephone industry lexicon, a.k.a. Data Service Unit; a device used for converting computer information from Data Terminal Equipment (DTE) devices to digital phone lines. T-1 line services can be distributed to one or more computers or videoconferencing units through a DSU device. A DSU is similar to a computer modem although information remains in digital form and is not converted to an analog signal. Conversion of the digital information into usable form is necessary for digital network data to be compatible with local phone network connection devices. (See RS-232)

**DTE - Data Terminal Equipment**

Telephone industry jargon for any equipment that is related to, or connects to, a computer workstation. DTEs refer to equipment at a user's location, and not to any phone company equipment used in its telecom network to provide transport or routing.

**DTH - Direct-to-Home**

Generally associated with satellite industry service providers that deliver video, audio, and increasingly Internet services directly to consumers/subscribers via small, 18-inch home satellite receiving dishes. (See DBS)

### DTV – Digital Television

In first quarter 2000, 61.3% of all U.S. households had access to free over-the-air digital television signals, according to the National Association of Broadcasters (NAB). Over 120 U.S. broadcast television stations have upgrade their station facilities enabling them to broadcast digital television in their local markets. In addition, 11 public television stations are currently transmitting digital signals, with another 29 stations expected to be on-air by the end of 2000. Only two of the commercial DTV stations (WCBS-TV, New York and KITV, Honolulu) are being carried on any cable systems, and each station is being carried only on a single cable system in their local area. At present, none of the public DTV stations are being carried by cable operators. The broadcast industry continues to urge the Federal Communications Commission (FCC) to adopt DTV carriage and interoperability rules, along with DTV set receiver performance standards” to clarify issues in order to continue to build on the industry’s momentum toward a full conversion to DTV. (See DTV Sets, Grand Alliance, HDTV)

### DTV Sets

DTV set sales reached 121,226 units in 1999, bringing the total number of DTV sets sold since the introduction of digital TV in August 1998 to 134,402 units. Fourth quarter 1999 DTV set sales totaled 67,811 units representing a 157% increase over 3Q99

sales, and a 467% increase over 2Q99 sales. CEA projects that the first 10 million DTV units will be sold by 2003, the next 10 million in 2004 and 2005, and 10.8 million in 2006.

Year	Estimated # of DTV Sets
1999	121,266
2002	1% HH Penetration
2003	10 million
2005	20 million
2006	30.8 million

Source: Consumer Electronics Association, January 2000

### Dubbing

The process of adding audio and/or video material to an existing video source. It involves using an main source input tape and at least one other input source with the output created on a third tape or recorded medium. In analog dubbing, the quality of the original source material is degraded during the dubbing process due to equipment imperfections. The amount of degradation acceptable for professional television use typically is down to the 3rd or 4th generation of videotape. As an extreme example, if a dub is performed to a VHS tape from a high quality TV studio tape machine, only about half of the resolution of the studio tape image could be retained due to the relatively narrow video signal bandwidth of VHS. VHS video contains only about 230 scan lines of picture resolution compared to 484 scan lines for standard NTSC broadcast television. As a result, a VHS dubbed tape would not be acceptable for broadcast quality after just one generation.

### Dumb Terminal

Refers to a computer terminal system with keyboard and monitor allowing users to interface with a mainframe computer, but without any individual microprocessing functions or capabilities. UNIX and VAX operating systems typically use dumb terminals where users are able to access information but have no local storage capability. (See Telnet, vt100)

## Duplex Communication - Dvorak Keyboard

### Duplex Communication

(See Full-Duplex, Half-Duplex, Simplex)

### DVB - Digital Video Broadcasting

Refers to European consortium initiated in 1993 to form standards for digital video broadcasting in Europe. DVB systems presently are in operation in the UK and being readied for start-up in other European countries. Digital terrestrial television (DTT) systems implement the DVB standard for digital broadcasting operations.

### DVD - Digital Versatile Disc

Developing disc-based digital video recording technology being hashed out by the video entertainment industry and electronics manufacturers for putting motion picture films and other video programming on small digital discs. Two competing technology camps agreed in December 1995 on a "Digital Versatile Disc" format incorporating aspects of both the Sony-Philips and the Toshiba-Time Warner digital video disc designs. Computer interests, including Apple, IBM, Compaq, Hewlett-Packard and Microsoft, want to ensure that any future DVD format will be compatible with a new generation of high-capacity CD-ROM discs and drives. A proposed DVD-ROM format would accommodate the content of multiple CD-ROM discs on one DVD platter. (See Divx, DVD-RW)

### DVD-RW - Digital Video Disk-Recordable/Writeable

The record-once format for creating DVDs. Pioneer Inc. announced in December of 1999 that it plans to ship the first recordable DVD players and DVD discs in North America and Europe sometime in the year 2000. The new Pioneer DVD player (which went on sale in Japan on Dec. 3, 1999, for \$2,399), can record up to six hours of content. Pioneer's DVD-RW recordable discs are expected to retail for approximately \$29 each. Philips Electronics officials say they will start shipping a DVD-RW consumer video player by the end of next year. A retail price has not been announced. (See DVD)

### DVE - Digital Video Effects

Special effects made possible by signal processing equipment that digitizes and manipulates analog video signals.

### DVI - Digital Video Interactive

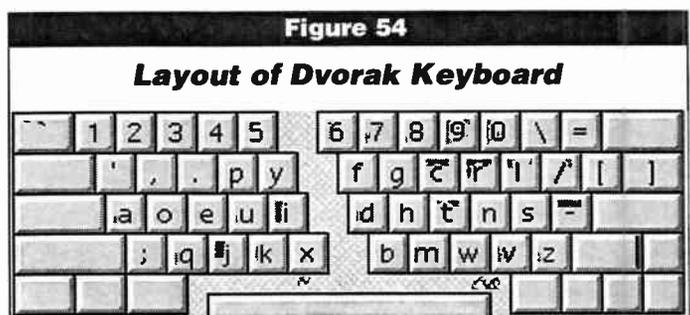
Intel system for the creation and interactive manipulation of real-time motion video on computer systems. (See Indeo Video)

### DVI-CD-ROM - Digital Video Interactive CD-ROM.

DVI is a brand name for a set of chips made by Intel Corp. for real-time video compression and decompression in personal computers. PCs with appropriate chipsets are able to read new DVI-CD-ROM discs. (See DVD)

### Dvorak Keyboard

Refers to a keyboard designed in the 1930s by August Dvorak intended to overcome the design flaws of the traditional "QWERTY" keyboard and increase



Source: Fentek Industries

typing speed. The most notable difference between the two keyboards is that the Dvorak design groups the most commonly used letters in the middle row of keys. (See QWERTY)

**DVS - Descriptive Video Service**

An audio service for the visually impaired transmitted by the Public Broadcasting Service (PBS) providing voice-over descriptions of program storylines or other visual program contents to enhance understanding and widen viewer/listener accessibility to aired programming.

**Dynamic Bandwidth Allocation**

Refers to a network management technique for allocating on-going or dynamic bandwidth capacities of multiple signals being carried over a single main network channel or line. The process allows high-capacity telecom network resources to be subdivided efficiently among multiple transmission applications by providing each application with only that share of channel bandwidth resources actually needed for transmission at that time.

**DYUV - Delta YUV**

A type of component video system based on using or transmitting only the difference (express as "Delta") in the value of luminance (Y) and chrominance (U&V) in each pixel from one digital frame to another in a video signal.

**E-Business - E-Commerce**

**E**

**E-Business**

Refers to business activity being conducted electronically relying in part, or wholly, on the interactive capabilities and growing penetration and use of the Internet for conducting

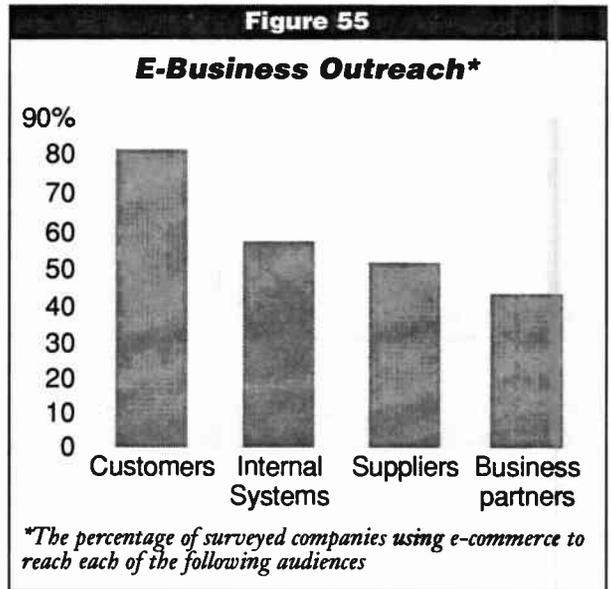
business transactions. Examples abound. Companies such as Amazon.com, Dell Computer through its Website, Dell.com, conduct most, or all, of their commercial consumer business transactions via the Internet. E-business encompasses a range of Net/Web-based activities from conducting the direct sales of goods and services, stock trading and other financial brokerage transactions, providing customer service support, to connecting customers, suppliers, partners, and employees via proprietary linked networks. The most common difficulty in deploying e-business initiatives is connecting older computer legacy systems to more up-to-date Internet/Web-based network systems. (See Active Server Pages, Common Gateway Interface, E-Commerce)

**E-Cash - Electronic Cash**

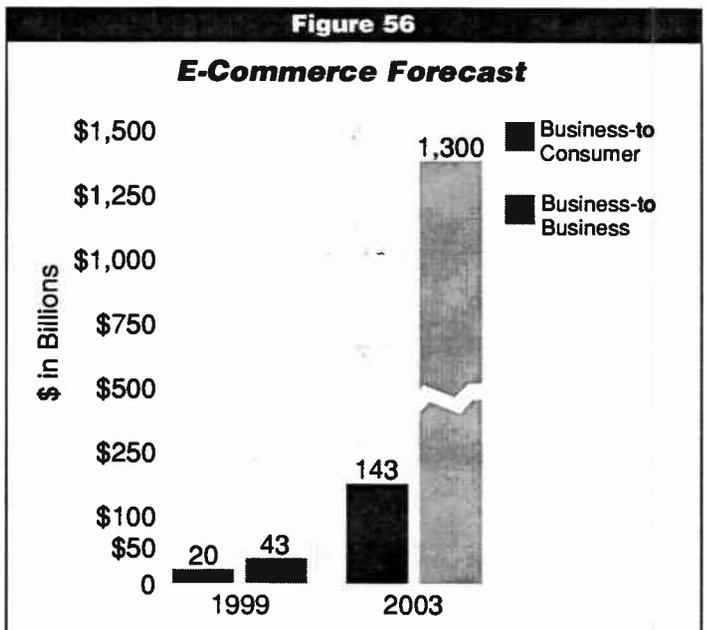
Generic name for several schemes to enable simple electronic transactions over various telecommunications networks. Key elements of a successful E-Cash system include security and wide acceptance.

**E-Commerce**

Electronic commerce covers an increasingly broad array of traditional and newer innovative business activities. Generally, it refers to the process of conducting of business communications and commercial transactions via computer networks that may use standalone private business networks, or which rely on the Internet for carriage of business commerce activities and transactions. The term especially is being applied to business activities such as the buying and selling of goods and services, and the transfer of funds through digital network links connected to the Internet. E-commerce activities also include inter- and intra-company net-



Source: Meta Group, Inc.



Source: Forrester Research, November 1999

Table 23

**E-Commerce Markets\***

Industry	1998	1999	2000	2003	Compound Annual Growth Rate
Manufacturing	\$16.5	\$20.9	\$27.5	\$52.9	53%
Financial services	12.6	16.1	23.6	52.8	47
Services	7.1	12.2	19.5	63.6	48
Government	4.8	7.6	10.6	25.2	56
Communications and media	4.6	5.5	6.5	10.1	27
Wholesale	4.3	6.1	9.2	30.0	70
Retail	3.0	4.1	5.0	9.7	49
Health care	2.6	4.3	5.5	11.5	57
Utilities	1.7	2.5	2.5	5.3	49
Education	1.7	2.2	2.7	5.5	48
Construction	1.7	2.9	4.2	6.7	94
Resource industries	0.6	0.8	1.0	2.9	36
Transportation and transport. services	0.3	0.5	1.1	5.9	73
<b>Total</b>	<b>61.5</b>	<b>85.7</b>	<b>118.9</b>	<b>282.1</b>	<b>50</b>

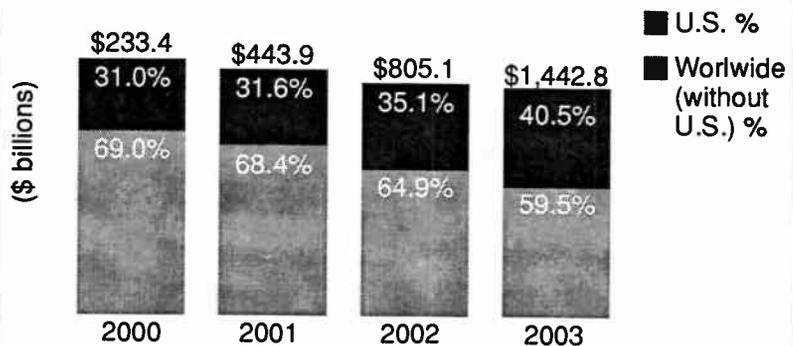
\* U.S. Corporate spending on Internet technology by industry (in billions)

Source: International Data Corporation

worked-based functions such as marketing, finance, manufacturing, business-to-business selling, and negotiations that facilitate business commerce. Also under the e-commerce umbrella are business activities involving electronic mail, electronic data interchanges, business file transfers, facsimile transfers (faxes), video conferencing, workflow processing, and interactions

with off-site remote computers. E-commerce developments are fueling the continued growth of the U.S. economy, according to the U.S. Department of Commerce. The size of the electronic commerce business sector remains relatively small — comprising only 8% of the nation's total economic output from 1995 to 1998. But E-commerce was responsible for *more* than one-third of the U.S. economic growth in this period. It is asserted that new e-world

Figure 57

**E-Commerce Projections**

Source: eMarketer, 2000

**E-mail - Earth Station**

business growth has steadied the rate of inflation and contributed significantly to the investment boom of the late 1990s. Investment in computers, electronic communications equipment and services accounted for more than half of the growth in business equipment spending from 1993 to 1998. (See Active Server Pages, Common Gateway Interface, E-Business)

**E-mail - Electronic Mail**

Electronic text messaging or "mail" software systems that transmit messages via in-house business LANs and a variety of electronic networks including telephone-based commercial on-line services, cellular phone networks or other wireless communication networks. E-mail packages allow computer network users to send and receive text messages and attached binary files such as spreadsheets, word processing documents, graphics files, among others. Growing in use and popularity, e-mail deliveries easily beat "Snail Mail" delivered by the Post Office as e-mail is posted to receivers literally in a matter of minutes across the country or around the globe. (See Computer-Mediated Communication)

**E-mail Attachment**

A computer file that is transmitted along with an e-mail message, attachments are a common way to send or distribute word processing files, spread sheets, graphics, digital photographs, and computer programs. (See Attachment, MIME, Trojan Horse, Virus)

**E-Port**

Although a trademarked product (e-Port), the term is becoming a generic reference for electronic kiosks. Such kiosks already are in widespread use in Europe and Japan and feature a range of consumer services. Electronic commerce kiosks or ports essentially are credit card readers that have been redesigned as Internet-anywhere appliances. A new device developed by USA Technologies, and backed by IBM is the trademarked product, e-Port. The new technology makes it possible to install multiple Web-based marketing services on an array of customer point-of-service (POS) machines such as ATMs, vending machines, or even office equipment. e-Port terminals will offer direct ordering of items from websites, free access to news and weather reports, local directions, maps, the ability to check personal e-mail, and request additional product information or discount coupons via email. Access is via a large touch pad with a credit card scanner. Via the touch pad users could access an advertiser's pre-loaded Web page(s). Instant purchases can be initiated using the touch pad, or a user can be connected by phone line directly to an advertiser's product fulfillment center via a built-in speakerphone. The technology represents the latest variation in the rapidly growing "out-of-home" media category including electronic billboards and similar signs on transit buses. E-port devices offer marketers opportunities for interactive advertising in high-traffic locations such as airports, hospitals, sports arenas, employee lounges and school dormitories, or in fairly non-traditional traffic sites such as public restrooms or airport baggage carousels. A potential down side could come in the form of consumer overload and a resulting e-commerce backlash. (See Kiosk)

**Earth Station**

Satellite industry lexicon for ground-based satellite receiving and/or transmitting antenna and equipment. Earth stations (also called earth segments to distinguish them from space segment satellite facilities) are usually large, fixed installations able to perform both uplink and downlink functions. But the term also has been applied to consumer back-yard satellite television antennas, particularly the larger 3 - 5 feet antennas used for C-band pay-TV reception. The size of an antenna or dish is dependent upon the strength of the satellite signal. Higher power satellites and

digital technology have decreased antenna size dramatically with home dishes now only 18-inches, and becoming portable. (See DBS, DTH)

### **EAS – Emergency Alerting System**

Replacing the Emergency Broadcast System (EBS) beginning in 1997, the government-prescribed EAS alerting system is set up to provide information to the public in bona fide emergency situations. Television and radio broadcasters, cable and certain other multichannel providers, acting in voluntary cooperation, are a key part of the emergency alerting network that can quickly pass emergency information to local, state or national regions of the country.

### **Eb/No – Bit Energy to Noise Density Ratio**

Used in digital communications to represent the influence of noise on the digital information being carried by a signal and correlates to a predictable bit-error-rate (BER) for a signal or channel. As a figure of merit, Eb/No is the ratio of the energy per bit in a digital signal (Eb) divided by the amount of noise power in the signal (No). This measurement of relative noise is akin in analog communications to the carrier-to-noise ratio. (See BER, C/N)

### **EDAC – Error Detection and Correction**

A process in digital communications systems where various degradations or damage to the digital information that results from being transmitted over a network can be detected and corrected through advanced engineering techniques. To accomplish this, included with each digital packet of bits are additional parity bits to help maintain the integrity of the digital signal. Error detection or parity check bits are included as header information and if any damage or corruption occurs during transmission these bits won't match the proper decoding sequence meaning an error has been detected. EDAC operations increase the efficiency of a network so that fewer bit errors are received at the receiving end. There are some drawbacks as EDAC systems cause latency (slower data rates) in the system because of the time spent verifying the data at various checkpoints.

### **EDI – Electronic Data Interchange**

Computer-to-computer exchange of structured transactional information between autonomous computers. EDI is often used to connect various parts of a business (such as billing, ordering, and inventory) with common vendors.

### **Editing**

In electronic editing, this refers to taking raw footage or an existing program tape (audio or video) and electronically manipulating, altering, enhancing, or otherwise changing the material to create a new version. Tape editing allows unusable portions to be cut, reworked, or rearranged.

### **EFS – Error Free Seconds**

The length of time measured in seconds that passes between digital bit errors during digital transmission of a signal. The EFS rate is a measure of the accuracy and reliability of a digital system.

### **Egress**

In telecommunications, refers to any signal leakage outside of the transport medium. For example, cable systems that are not technically tight will often suffer signal leakage at loose connectors. These points of leakage in the system will interfere with over-the-air communications operating within the same frequency spectrum. (See Interference, Noise)

**EHF - Extremely High Frequency**

Part of the radio spectrum in the range of 30 GHz to 300 GHz that is used for transmission of signals via a direct line-of-sight path. (See Spectrum)

**EIA Interface**

Applies to technical standards established by the Electronics Industry Association (EIA) for connections made between electronic devices. Often loosely used to mean RS-232, which is one of the most widely recognized EIA interface standards. RS-232 connections are used to enable serial data transfers to/from a computer and various external peripheral devices such as modems, printers or other peripherals. (See RS-232)

**EIDE - Enhanced Integrated Drive Electronics**

Refers to an interface standard used on computer hard drives to allow them to access and transfer data more quickly. Sometimes called "Fast ATA" or "Fast IDE," this standard has made it possible for even inexpensive computers to be used for previously difficult to manage tasks such as desktop video editing and complex graphics work.

**EIRP - Effective Isotropic Radiated Power**

EIRP is a measure of the strength of a transmitted signal such as from a satellite, or a broadcast antenna, as compared to an isotropic source and is expressed as a number of dB. (See dB)

**EISA - Extended Industry Standard Architecture**

A computer acronym for a type of computer bus architecture that allows for compatibility with the IBM bus architecture for personal computers. EISA is a 32-bit architecture and is able to interconnect multiple CPUs to the bus. (See Bus)

**Electromagnetic Spectrum**

Refers to the complete range of electromagnetic waves found in nature including in order from lowest to highest frequency: radio, infrared, visible light, ultraviolet light, X-ray, gamma-ray, and cosmic ray waves. (See Spectrum)

**Electronic Coupons**

Technique developing with the advent of new digital datacasting and on-line businesses in which advertising or other promotional materials can be sent electronically directly to consumers or business customers. Versions of electronic coupons can be found on the Internet and are viewed as a feature of emerging datacasting and data broadcasting businesses delivered via radio and television broadcasting operations. Redemption of electronic coupons varies but users might simply print the coupon on hand-held PDAs with a built-in printer, print hard copies on a computer, download or store the coupon on a "smart card" memory. (See Datacasting, PDA, RBDS)

**EDI - Electronic Data Interchange**

One of the foundational components of electronic commerce, EDI is an evolving standard developed in the early 1980s that promotes the digital exchange of orders, notices, forms, invoices, and other types of business information over computer networks. (See E-Business, E-Commerce)

**Electronic Media Market**

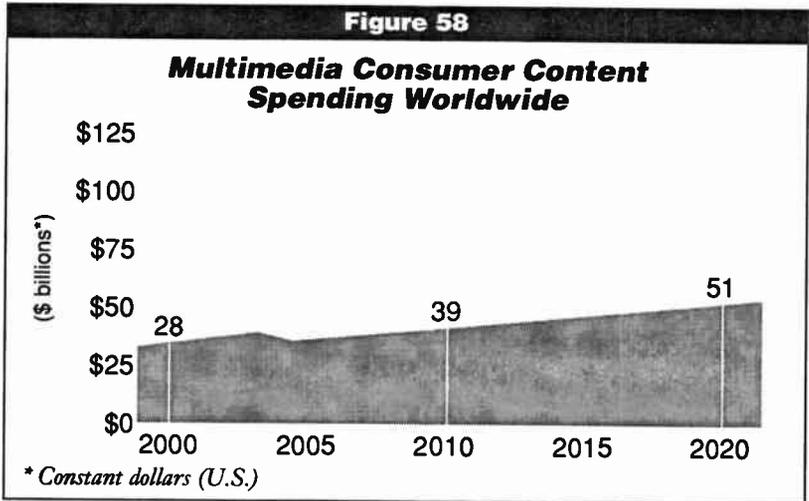
Refers to rapidly growing digital-based electronic media market encompassing an extensive range of consumer equipment, products, systems, and services ranging from computer laptops, portable DVD players, and wireless Internet appliances to Web e-commerce including website subscriptions, and online consumer purchases. (See DVD, E-Commerce, Internet, Online, PVR)

**Electronic Newsletter**

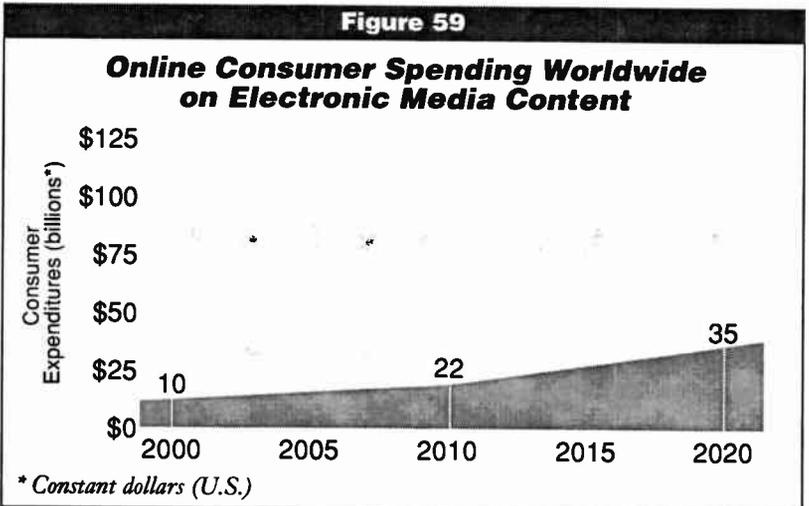
Electronic newsletters differ from traditional newsletters primarily in the means of distribution. While traditional printed newsletters are mailed or otherwise physically delivered to the recipients, electronic newsletters are sent electronically by means such as e-mail or the Internet. Rapid delivery offers opportunities for more time-sensitive delivery of information and on a more frequent basis. (See E-mail, Internet)

**Electronic Organizer**

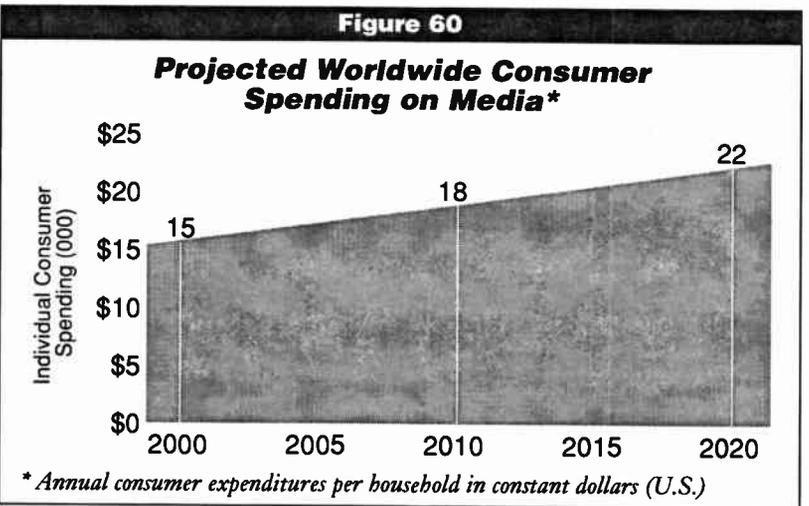
A small electronic storage device with limited memory chips that are replacements for daily-reminder pocket notebooks. Organizers



Source: InfoTech, Inc., © 1999 InfoTech. Contact <http://www.infotechresearch.com>



Source: InfoTech, Inc., © 1999 InfoTech. Contact <http://www.infotechresearch.com>



Source: InfoTech, Inc., © 1999 InfoTech. Contact <http://www.infotechresearch.com>

**Electronic Paper - Ellipso**

are useful for scheduling, storing important personal information such as address and phone lists, and may have limited word processing capabilities for notes. Organizers are becoming smaller, lighter and with expanding capabilities such as wireless interfaces for receiving paging or e-mail messages. The devices are being made to be compatible with desktop computers to facilitate the up and downloading of files from office to home PCs or visa versa. (See Hand-Held, Palm-Top Computing, PDA)

**Electronic Paper**

Refers to a technology invented by Xerox that is based on an invention called "gyricon." Gyricon sheets are thin layers of plastic that contain millions of tiny beads that act something like toner particles in a fax machine or copier. Contained in small oil-filled cavities, the beads rotate around as electrical charges are applied to the gyricon, showing different colors and creating images, including text and pictures.

**Electronic Payment System**

Monetary exchanges over the Internet or other private digital networks. (See Cybercash, Electronic Wallet, E-Commerce)

**Electronic Wallet**

Also called a virtual wallet, the term refers to a software mechanism that allows e-commerce users to store and use credit card and electronic payment information on a cybercash server. Typically, information in the e-wallet is encrypted and is available from one e-commerce session to the next occasion. (See Cybercash)

**ELF - Extremely Low Frequency**

Part of the electromagnetic spectrum in the range of 30 Hz to 300 Hz. Such longwave signals make them propagate well in water and are often used in submarine surveillance operations. (See Spectrum)

**Ellipso**

Ellipso is a satellite telecommunications company that is constructing a system of 17 satellites to extend "the Internet, cellular and public telephone systems virtually anywhere on the planet." Ellipso's satellites will be in medium earth orbit (MEO), which will enable them to provide signal coverage to a much larger area than low earth orbit satellites (LEO). Using this higher range orbit will reduce the number of ground stations that it will require. Its initial build-out will include 12 ground stations, and new ones will be added on an as-needed basis. The Ellipso system essentially will operate like a cellular phone system in space, with the ground stations acting like the cell-site controllers in a cellular system. Ellipso will use an Internet protocol (IP) backbone network that it says will enable it to "seamlessly interconnect into our distribution partners' networks around the world...with whatever protocols they require." The Ellipso satellite system will use CDMA signaling to provide voice rates of 2.4 kbps, and data rates of 28.8 kbps. Its user terminals will transmit on uplink frequencies in the 1610.0-1621.5 MHz band, and they will receive transmissions from the satellites in the 2483.5-2500.0 MHz band. The bandwidth of the CDMA signals will be 2.5 MHz or 5.0 MHz, depending on the type of service and the operational conditions.

**Elliptical Orbit**

Satellites launched into a non-circular orbit in contrast to circular geostationary, polar or inclined orbits, will have the shape of an ellipse. Elliptical orbits are useful for satellite applications that typically are not for communications, but for scientific, remote sensing, monitoring or other purposes. (See Geostationary Orbit, Polar Orbit)

**EMI - Electromagnetic Interference**

Electronic equipment is often subjected to electrical or magnetic forces that can interfere with these systems. Unwanted electrical current, either inside the system or outside the system, can cause interruptions or otherwise interfere with signaling operations. Three methods used to control EMI are electrical grounding, signal filtering, and physical shielding. (See Filter, Ground, Shield)

**Emoticons**

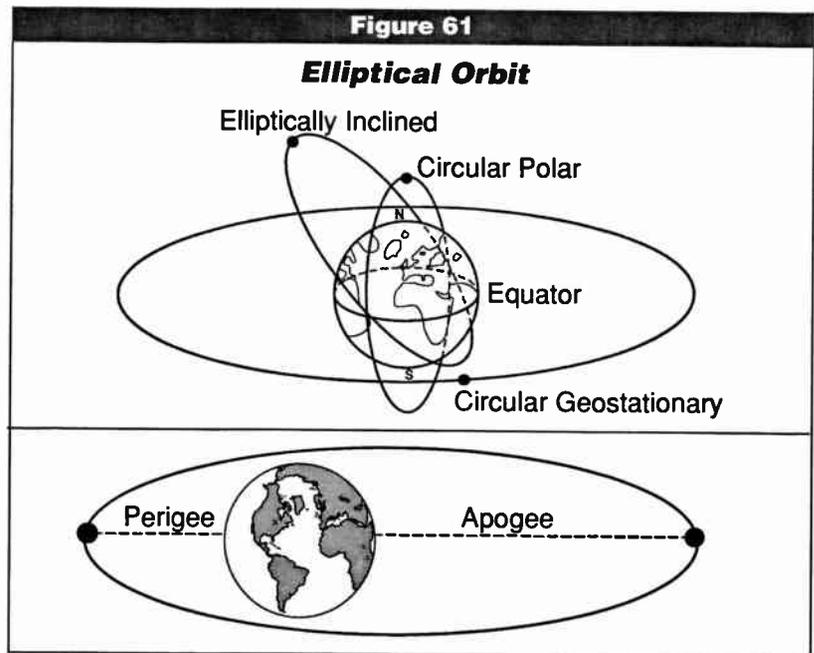
Refers to the keyboard-generated symbols intended to express emotion. The most commonly used emoticons include the "smiley face" :-), and the "frowney face" and the "half smiley" ;-), which is intended to communicate a wink of the eye. (See Computer-Mediated Communication)

**EMP - Electromagnetic Pulse**

An extremely large burst of energy with high intensity that would create a great surge of an electromagnetic wave pulse or pulses. Theoretically, origination of an EMP could be associated with a nuclear explosion in outer space and be potentially dangerous as it could render un-hardened communication systems inoperable.

**Emulation**

The process of intentionally duplicating the operation of one system through the use of another system. Emulation is the use of hardware and/or software to enable one type of data terminal or computer system to mimic or emulate a different type of terminal or system. Emulation systems or devices are used in networks to overcome certain kinds of compatibility or interoperability problems between systems that cannot, or will not, "talk" to one another. In a data network, it is often possible to run otherwise incompatible programs by emulating or imitating the originating system. The emulation can be thought of as imitating another system. LAN (Local Area Network) Emulation is being used with Asynchronous Transfer Mode (ATM) networks in order to make them operate with embedded networks. This could allow an ATM backbone to be attached to an Ethernet LAN and provide all the transmission advantages of ATM while still allowing the user to interface with the system through the already familiar Ethernet network. (See ATM, Ethernet)



**Encoding/Decoding - EPG****Encoding/Decoding**

The process of converting an analog signal into digital coded form usually for transmission purposes, but also for recording or storage purposes, and the subsequent reversal of the process via decoding to transfer the signal back into its original analog state.

**Encrypted "Containers"**

Designed to prevent abuses of copyright on the Internet and to make sure that owners of computer programs and digital text files are compensated properly, encrypted "containers" use software with information about who owns the work and information about constraints on the work's use and related pricing plans. When a user accesses a copyrighted work, the encrypted container is opened and the user is given several options, from buying the entire file for unlimited use to purchasing only a portion for one-time use.

**Encryption**

The process of coding or encrypting any data in which a specific code or "key" is required to decode, unscramble or otherwise restore the data to its original form. For a variety of security or signal integrity purposes, datastreams often cannot be transmitted in their normal state. In these cases, an algorithm or mathematical process, is applied to the data converting it so it cannot be understood or interpreted without first decrypting or reversing the process using the same algorithm. (See Advanced Encryption Standard, Algorithm, Clipper Chip, PKI, Secure Server, Virtual Private Network)

**ENG - Electronic Newsgathering**

Term applied to capturing news events using portable field television cameras and support equipment using videotape footage or live coverage of events for broadcast during network or local news programs. An ENG truck generally would also have a microwave transmitter in order to beam captured video footage back to the station for immediate processing for use in news broadcasts. (See SNG)

**Enterprise-wide**

Computer networking reference meaning an entire business organization's infrastructure which might include branch offices, as well as the main office and any subsidiaries. The term encompasses the full range of an organization's physical locations as well as the people and other resources available at these locations.

**Environment**

The operational surroundings for running a particular software program or hardware platform. A particular computer or network "environment" is characterized by compatible system hardware, software, peripherals, input and output systems, traffic flow and network management protocols. Within a particular systems environment, connections can be either physical or virtual. A workstation environment would include human productivity elements as well such as lighting, proximity to needed equipment (phones, speakers, files etc. ergonomic seating, padded wrist rests, mouse pads, etc.

**EPG - Electronic Program Guide**

Developing segment of the video market comprised of new sophisticated menu-driven program selection navigation tools. Such software-based navigation systems may be similar to graphical user interfaces (GUI) used for computer navigation such as Windows. EPGs are becoming available with new multichannel DBS satellite services, and are planned for cable and new telephone video broadband networks promising access to hundreds of interactive video-on-demand and other video, audio, and information services.

**Equalizer**

An electronic circuit or device that adjusts the frequency response of a system to compensate for already recognized or expected distortions in the system. In audio systems, an equalizer device can be used to manipulate the equality and/or uniformity of designated frequencies in reference to ideal audio signals. A stereo equalizer allows listeners to alter stereo sound according to audible frequency ranges. For example, the bass can be made louder, treble made softer or any other combinations depending on the sophistication of the equalizer. In digital television broadcast environments, an equalizer would be used to compensate for imperfections in the transmitter. A transmission equalizer would change the original signal by adding an "adjustment" signal so that after combining the two, a correct signal is transmitted. In future digital television receivers, equalizers will compensate for variations in the received signal resulting from time-variance changes as well as adjusting the frequency response of the receiver to better match the theoretical frequency response of the transmitted digital TV signal. (See Frequency Response)

**Erase Head**

A device in audio and video tape recorders that removes or erases information from a tape by demagnetizing it. This is usually done so new information can be recorded onto a "clean" tape or to insert new material in erased portions.

**Ergonomics**

The study and design of the arrangement of equipment, especially computer equipment, so that users can interact with that equipment in a healthy, comfortable and efficient manner. Ergonomics have become especially important in the design of computer keyboards, monitors, pointing devices (mice), desks, chairs, and the work environment in general. (See Repetitive Strain Syndrome)

**Erlang**

A measure of time used in telecommunications traffic engineering that is used to determine telephone usage and line needs. A conversation using one full hour is equal to one ERLANG. Traffic on a trunk group, when measured in Erlangs, is equal to the average number of trunk lines in use during a specific time frame and is an indication of network capacity requirements and patterns. The term is named after Danish telephone engineer A.K. Erlang, the "father of queuing theory." (See Traffic Engineering)

**ERP - Enterprise Resource Planning**

Refers to any accounting-oriented software system designed to support and automate the business processes of medium and large businesses. ERP applications are especially designed for management of manufacturing and distribution functions, project management, personal office administrative functions, payroll, and company financial accounting requirements.

**Error Correction**

A method of ensuring that data received via a system connection is as complete and accurate as the data originally sent over a telecom, satellite, or data network channel or system. Real world transmission are not loss-less as many factors can be introduced to corrupt transmission bit streams producing data errors due to lost or corrupted bits. Sophisticated error detection and correction schemes are integral parts of digital data transmission systems, with further R&D work consistently in progress to improve performance.

**Error Rate**

A measure of the percentage of errors in a specific digital data transmission. Errors occur when

**Escape Character - Eureka**

all of the data is not received, or parts are received incorrectly or corrupted. The error rate measures the amount of errors compared to the number of data "pieces" received correctly and accurately. (See BER)

**Escape Character**

Term often used for any sequence of characters or keyboard commands that temporarily suspends a computer process. An escape character is generated with the Escape key, a special key that exists in the upper-left corner on most computer keyboards. When the escape character is combined with other characters, it is called an "escape sequence."

**ESMR - Enhanced Specialized Mobile Radio**

New enhanced SMR services increase channel capacity up to 18 - 26 times the amount available on traditional SMR systems. In each SMR 25 kHz voice channel, ESMR technology can provide 3 voice circuits with an equivalent radio-frequency bandwidth of approximately 8 kHz each. ESMR uses TDMA coding scheme with QPSK modulation. Given better digital compression techniques even further capacity improvements are possible. ESMR's operate cellular-like transmission operations with maximum power of 100 watts at 200 feet, whereas conventional SMRs operate with 1000 watts at 1000 feet.

**ESS - Electronic Switching System**

A telephone switch which uses electronics or computers to control the switching of calls, their billing and other functions. This is in contrast to older switching systems that used actual human operators to make the switched connections. The electronic systems are much more efficient to perform this process.

**Ethernet**

Ethernet is a form of Local Area Network (LAN) conforming to specific standards including operating at 10 Mbps which is widely used for interconnecting computer systems. First marketed jointly by Xerox, Intel and Digital Equipment Corporation (DEC), Ethernet uses thin coaxial cable and twisted pair wire to connect computers and peripheral devices to the network. Attached network computers require installation of an Ethernet network interface card (NIC) in an expansion slot allowing the computer to communicate with the network. Ethernet employs as its access protocol Carrier Sense Multiple Access with Collision Detection (CSMA/CD). (See CAT-5, Expansion Slot, NIC)

**ETV - Educational Television**

Generally refers to using television for educational purposes. ETV networks are used a great deal in distance learning, medical training, and corporate job training programs as well as by educational institutions from elementary to university levels. Public television stations carry a full schedule of ETV programming such as news, documentaries, children's programming, special interest shows, and the Arts (including music, dance, and theater).

**Eureka - European Research Coordination Agency**

Central organization for the coordination of technical research efforts to support development and potential manufacture of marketable technological products in Europe. Eureka is a consortium of 22 countries in Eastern and Western Europe designed to promote cross-border cooperation in major "market-driven" research and development projects. Various projects are self-initiated by industrial groups/organizations, research organizations, scientists, and engineers, and must involve significant financial commitment from participants, as well as the active involvement of at least two different Eureka consortium members. Contacts will be localized to different

task groups, and normally will be headed by the prime Eureka participant, for example, DLR for the Eureka-147 initiative. (See Eureka-147; ETSI and Eureka in Appendix)

**Eureka-147**

Refers to a technical standard developed for digital audio transmission which is being implemented, at present, in many parts of the world, and in particular it is the basis for the digital audio broadcasting (DAB) system being adopted in Canada and Mexico. The technical standard was developed by the Eureka-147 task group, adopted by the European Telecommunications Standards Institute (ETSI), and subsequently recommended as a standard by the International Telecommunications Union Radio Sector (ITU-R).

**Exchange Server™**

Microsoft's system for coordinating electronic mail, calendaring, task lists, contact information and other details. Exchange has quickly emerged as an industry leader in the back office operations of many companies and organizations. (See Workgroup Computing)

**Expansion Slots**

Computer hardware terminology for specific "slots" or locations in a computer where additional circuit boards or cards (a.k.a. add-in cards) can be inserted or plugged in to expand the functionality of the computer by adding additional features or functions. Expansion slots vary in number and size by type of computer. Types of cards that are inserted into computer expansion slots include internal telecommunications fax modem, a sound card, or a network interface card.

**Expert System**

Refers to an artificial intelligence application that uses a knowledge base of human expertise to solve problems. While expert systems are designed to perform at the level of a human expert, sometimes they perform well above and well below that level. Expert systems are used in applications such as medical diagnosis, equipment repair, investment analysis, estate and insurance planning, route scheduling for delivery vehicles, contract bidding, counseling for self-service customers, production control and training. (See Agent, AI, Bot, Spider)

**Extranet**

Refers to the extension of a corporation's or organization's "intranet" (internal, private network) out onto the Internet, typically to allow approved customers, suppliers, and off-site workers access to the company's private data and applications from the World Wide Web. (See Disintermediation, E-Commerce, Internet)

**E-zine**

A regular newsletter or magazine-type publication often offered free of charge, that is distributed in an electronic format typically via the Internet, but also may be distributed electronically via email or CD-ROMs.

**Facility - FAX Modem****F****Facility**

Term used to refer to a physical building location, or the equipment and systems at a location, or both in which case the term used might be physical plant and equipment. A telephone company or cable system's network of lines, switches, nodes, etc., are commonly referred to as its facilities or simply as its plant.

**FAQ - Frequently Asked Questions**

This refers to a commonly offered special service area for information that is made available to new users or customers that access various websites. FAQ portions of a website are attempts to proactively answer many of the most common and fundamental questions asked by consumers or users about a company, a particular topic, or area of concern. For example, a company might encourage stockholders to go the FAQ page on its website to find details on a pending merger agreement. Software companies might direct users to their website FAQ page for help on program installations, or to resolve commonly experience problems encounter when using a particular product or service.

**Fast Ethernet**

(See 100 Base T)

**Fast Packet Switching**

A high-speed transmission technique used for sending information over a Wide Area Network (WAN). Asynchronous Transfer Mode (ATM) is an application of Fast Packet Switching methods. (See ATM, Packet Switching, WAN)

**FAT - File Allocation Table**

A separate file table on the storage device, which organizes and keeps track of the contents of that storage device. The storage device is normally a floppy disk or a hard drive on a computer. When files are stored to one of these devices, portions of the same file can be physically placed in different, non-adjacent positions on the disk. The FAT keeps track of these various locations and is necessary to access to this information.

**FAX - Facsimile**

An electronic device attached to a phone line that digitizes text, picture, graphics, or other information printed on a paper for transmission over regular telephone lines. Images are received and reassembled by a receiving FAX machine, which then prints a facsimile copy of the original document. Typically, fax copies are not of high visual quality, but the value of instant reproduction or printed material anywhere around the globe usually outweighs this disadvantage.

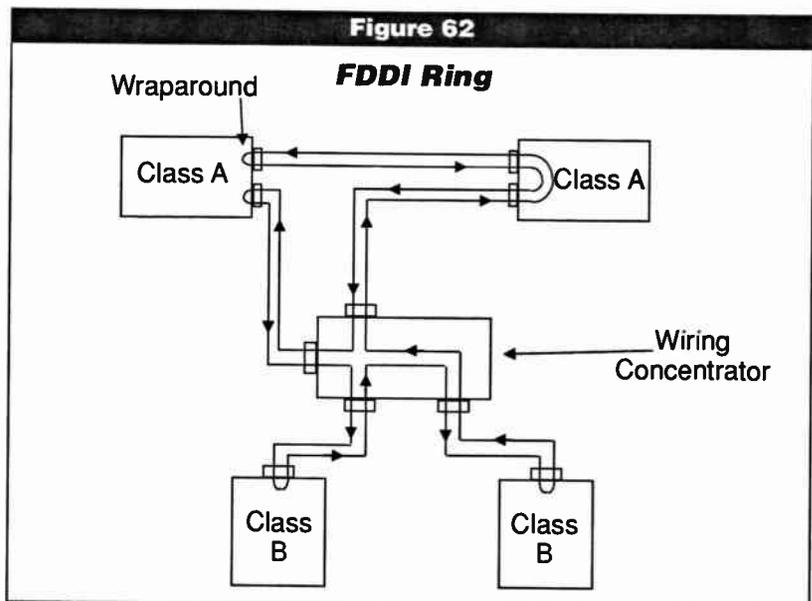
**FAX Modem**

FAX modems are typically used with personal computers to enable the computer to act as a FAX machine to transmit data or text files directly via the telephone system to a regular stand-alone Fax machine or to another computer with FAX modem reception capabilities. An internal computer fax modem is a type of electronic circuit board or "card" that can be plugged into an expansion slot in a computer. An external fax modem is a separate device that is connected to a computer and provides the same functional capabilities. Usually, computer fax modems do not have the ability to send traditional faxes from printed hard copies on paper, although such functions are beginning to be added to equipment for the growing home office market. (See Expansion Slots)

### FDDI – Fiber Distributed Data Interface

FDDI is a type of LAN network using optical fiber lines for data transmission and often is part of a backbone network due to its large carrying capacity and high data rate capabilities. FDDI systems operate at 100 Mbps and the advantages include the ability to support up to 500 computers and/or peripheral devices and built-in redundancy network protection. The basic structure for FDDI

networks is two-ring architecture where the second ring provides an automatic back-up system or self-healing redundancy; if any part of one ring is broken, the system switches to the second ring for continued operations. (See Backbone Network, LAN, Token-Ring)



### FDDI 2

A version of an FDDI fiber network providing the same 100 Mbps transmission rates but FDDI 2 networks have the ability to carry voice and video, as well as the data. (See FDDI)

### FDMA – Frequency Division Multiple Access

A modulation and multiplexing technique for dividing a digital communication path into different channels based on an assigned frequency. FDMA enables multiple access to spectrum resources by dividing the spectrum block into multiple smaller-frequency channels. For example, in a cable television system where multiple channels are sent over the same cable line, the different channels are assigned different carrier frequencies and then multiplexed for transmission over a single line. Customers are able to receive 40 or more channels of video programming over a 240 MHz bandwidth system, with each 6-MHz video channel carried at a different frequency.

### FEC – Forward Error Correction

A technique for managing interference or other degradations that produce errors in the digital bitstream of transmitted communication signal. FEC techniques attempt to reduce errors by adding correction techniques in the form of redundant bits at the transmission end of a signal link. The redundant bits then are used at the digital receiving terminal to detect, locate, and correct any transmission errors before final delivery to the local data communication end-point.

### FED – Field Emission Display

A type of flat panel display technology is called field emission display (FED). Prototype FED screens use less power than conventional LCDs, are about half as thick, can be viewed from an angle unlike most LCDs, and cost about a third less to produce. A French company, PixTech is in partnership with Motorola, Texas Instruments, Raytheon and Japan's Futuba to act as a clearing-house to sub-license one partner's display technology to all of the others. Fujitsu, Matsushita,

**Feedback - Field Frequency**

Sony, and NEC all have major plans to produce large flat panel television screens measuring up to 50-inches to hang on viewing room walls. (See Flat Panel Display, FPD, Plasma Display)

**Feedback**

A common reference for the return of a communication signal back to its source. Feedback can be unintended or intentional. Interference or cross talk is unintended feedback in telecommunication channels. Intentional feedback loops are integral even critical parts of a system design and are used for a wide variety of purposes. Internal system error checking tasks often use feedback responses or acknowledgments. In developing interactive video networks, separate feedback loops or upstream channels are used for ordering PPV events or for acting on customer video-on-demand requests.

**FEP - Front End Processor**

A system design in which a computer specifically for managing set-up and maintenance tasks is attached to another, often larger and more powerful, major computer system or network. The larger computer does most of the processing with the FEP acting as an interface between the main CPU and other systems such as the bus or memory. The front-end processor can be responsible for providing conversion protocols between incoming information and the main processor, error control, or creating instruction data sent from the processor to other parts of the system.

**Fiber Optics**

Long strands of glass fibers usually bundled by the thousands into a fiber core with surrounding reflective and insulating materials to form a fiber optic cable. Fiber optic cables are used to transmit high speed light signals (lightwaves) generated by advanced optical lasers. The optical lasers emit light pulses (on/off) to correspond to the binary coding in a digital signal enabling the high speed transmission of digital voice, video, text, data or other digital information over fiber lines. Broadband fiber optic lines have the highest transmission capacity of any known physical medium and data rates have approached 100 gigabytes per second in laboratory experiments. Fiber optic lines are beginning to replace older copper wiring or coax in upgraded telecom and cable television systems. Fiber has significant capacity advantages allowing for much higher information transfer rates than copper wire or coaxial cable and lightwaves are immune to typical electromagnetic interference producing more accurate digital transmissions. (See Broadband)

**Field**

1. In NTSC television or video, there are two fields in every video frame in the interlaced video signal. Each field is created by scanning the image on a camera's active sensor. The first field contains only half of the information (from every other line). The second field contains the lines not in the first field (one line displaced from the first field).
2. In computer database systems, a field refers to the specific location where certain data can be found in a record or file.
3. Field also refers to the area of magnetic influence around magnetic devices, as in magnetic field, or the electrical influences around current-carrying devices, as in electric field. Similarly, a field is the area of combined influences around electromagnetic devices, such as an antenna that has its own electromagnetic field.

**Field Frequency**

A measure of the speed at which an interlaced video monitor reproduces or "refreshes" half of the picture information. In interlaced scan systems, flicker can generally be perceived if this frequency is below 40 Hz.

**Field Rate**

The rate at which a field of video is scanned or displayed. In the existing analog NTSC television system, the field rate is about 60 (59.94) fields per second. The field rate expressed in the number of cycles per second is 60 Hz.

**FIFO – First In, First Out**

A common processing technique in which information is processed in the order in which it is received. In telecommunications systems using a FIFO protocol, the first piece of information received is the first piece processed, transferred and sent out. Buffer storage areas used to hold information to be processed by a computer can use FIFO to manage this task. (See Buffer)

**File**

In computers, a file is a group or block of information, which share some characteristics. A file can be a database collection of names and addresses or a word processing document containing a business letter or other text. Files are created according to an established format or structure enabling them to be recognized, manipulated, sorted or called up for later processing.

**File Extension Label**

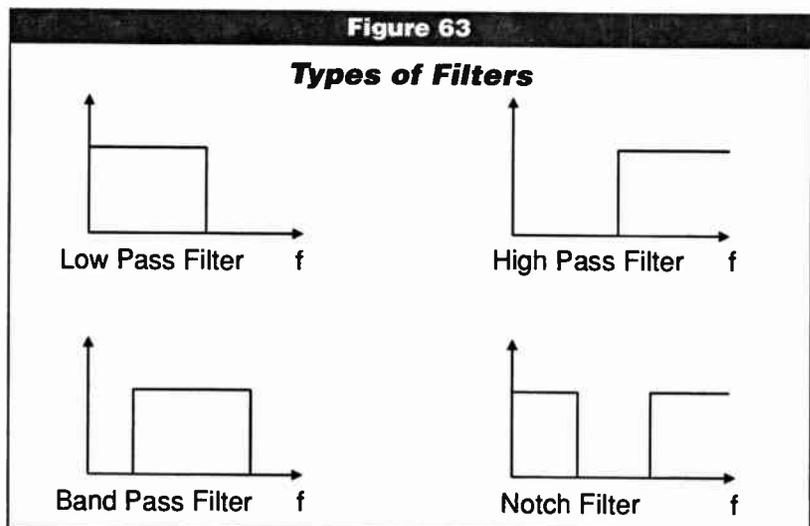
Refers to the labeling on many software application files to identify which software program created the file. For example: Microsoft Word files (.doc), Excel files (.xls), or Powerpoint files (.ppt).

**File Server**

A computer network device typically on a local area network (LAN) that stores computer files for access/retrieval by other desktop PCs or other "client" computers connected to the local network. File servers enable any user connected to the network to retrieve files from a single storage facility or group of servers. File server equipment combines data management software along with extensive file storage capacity, which may have a large amount of RAM as well as an array of hard drives to support these network functions. (See Client/Server, LAN)

**Filter**

An electronic device, which allows or permits only a selected range of frequencies to either be passed on through or blocked from entering a system. Types of electronic filters include high pass, low pass, band pass, and notch filters. A high pass filter only permits high frequencies in a particular signal to pass on through the filter, while a low pass filter performs the similar function but allowing only low frequencies to pass through. A Band Pass filter permits a selected range or band of frequencies to pass, and a notch filter allows any frequency to pass except for those within a small, specified range.



Source: NAB

**Finger - Flame****Finger**

Similar to a telephone directory for a computers system, finger is a program that displays information about a particular user or about all users logged onto a computer system, sometimes including the user's name, email address, and system usage information. "Fingering" users is most common on computer networks running UNIX operating systems. (See UNIX)

**FIPS - Federal Information Processing Standards**

Sets of regulations or protocols overseen by the U.S. Department of Commerce that attempt to standardize the National Information Infrastructure (NII). The National Institute of Standards and Technology (NIST) creates publications that notify information technology industries to protocols that allow for transparent interconnection of networks and security issues that will help maintain the integrity of a nationwide network (See NII, NIST in the Appendix)

**Firewall**

In cyberspace lexicon, a firewall is a security device normally erected between an internal computer network and outside access points including the Internet or other on-line networks or services. Firewalls are comprised of protective software and hardware to prevent unauthorized access to a private computer network and/or particular segments of the network. Certain firewalls are designed to prevent network traffic from being sent outside or into protected areas where it might intentionally or unintentionally damage the system. (See Proxy Server, Virtual Private Network, Virus)

**FireWire**

A high-speed serial bus developed by Apple and Texas Instruments that allows for the connection of up to 63 peripheral devices. Also known as the IEEE 1394 standard as well as the High Performance Software Bus (HPSB), the original specification calls for 100, 200 and 400 Mbits/sec transfer rates. IEEE 1394b provides for speeds up to 800, 1,600 and 3,200 Mbps. FireWire supports hot swapping, multiple speeds on the same bus and isochronous data transfer, which guarantees bandwidth for multimedia operations. It is most commonly used for attaching digital cameras and other video devices to the computer.

**Firmware**

Refers to software that is stored on a chip in a digital device, such as a handheld computer or a digital camera, which is often used to control the internal functions of the device. Firmware maintains essential operational information and preserves critical timing and other settings when the power is turned off. In some cases, users must replace the firmware chip in order to upgrade the software embedded on it. (See ROM)

**Flag**

As used in computer environments, a flag is an indicator in a software application alerting the control unit, the portion of the CPU that decides what the computer will and will not process, regarding the status of a program instruction or piece of information. Flags can be attached to information to alert the system that certain conditions were or were not met, such as when an instruction is processed, the flag will tell the Program Counter to go to the next number. This process tells the CPU that it must fetch the next instruction to process. (See CPU)

**Flame**

A cyberspace or Internet-related reference usually regarding individuals who participate in on-line dialogs in open Internet forums that either are not aware, or more likely, choose to ignore certain standards of Internet etiquette. Criticisms and complaints leading to more stridently

worded responses tend to have propagating effects producing higher levels of verbiage to the point of Flame Wars. Not a pretty sight. (See Chat, Computer-Mediated Communication, E-mail, Forum, Newsgroups, Usenet)

**Flash™**

An animation platform developed by Macromedia, Inc., that delivers smooth, compelling animations and interactive interfaces via the World Wide Web. Flash animations are “vector based” meaning that the relationships among the graphical elements are calculated on relative positions rather than fixed positions. As a result, the animations are resizable and their files are relatively small, making them ideal for Internet file transfer. In order to view the content based on the Flash platform, a small “plug-in” or add-on program is required for Web browsers prior to 4.0 versions. Current Web browsers have the Flash player already built into the software. (See Vector Graphics)

**Flash Memory**

Flash memory is a type of constantly powered nonvolatile computer memory that can be easily erased and reprogrammed. It is a variation of “Electrically Erasable Programmable Read-Only Memory” (EEPROM). Flash memory is often used to store control coding such as for the Basic Input/Output System (BIOS) in a personal computer. Flash memory is currently used in many digital devices including digital cellular phones, digital cameras, LAN switches, PC Cards for notebook computers, digital set-up boxes, embedded controllers, and other digital devices. (See BIOS)

**Flat Panel Display**

An emerging class of displays that is growing in popularity because of their 3-5" thickness, flat panel displays are now widely available for computer systems. Innovations in advanced plasma technology have also made possible the development of large, thin high-resolution display screens that are wall mountable and use a 16:9 aspect ratio. (See Backlighting, LCD)

**Flicker**

A fundamental principle in viewing film and video materials is the concept of a series of individual frames of pictures shown in rapid sequence, but if the rate is too slowly then flicker or slight breaks in the action can be perceived by viewers. A physical property called “Persistence of Vision” (POV) is the ability of the human eye and brain to meld together individual pictures (i.e., frames) when viewed in rapid sequence to create smooth transitions that emulate motion. To eliminate flicker, the standard NTSC television system replaces video picture information at a rate of 30 frames per second (fps) whereas 35mm film operates at 48 fps to achieve an even smoother full-motion effect. (See Interlaced Scanning)

**Floppy Disk**

A form of computer storage medium consisting of a thin flexible plastic disk with a magnetic oxide coating held inside a protective sleeve on which program applications, data files or other digitized information are stored. Floppies are light, cheap and portable but not as reliable as hard disks. The most common floppy disk today is the 3.5-inch diskette; older versions included 5 1/4 and even 8-inch disks. Floppy disks are used mainly for temporary storage and with laptop portables.

**Floptical**

A combination of “floppy disk” and “optical” referring to a type of disk drive technology that uses a combination of magnetic and optical techniques to achieve greater storage capacity than normal floppy disks, without sacrificing access speeds. (See Floppy Disks, Optical Disc)

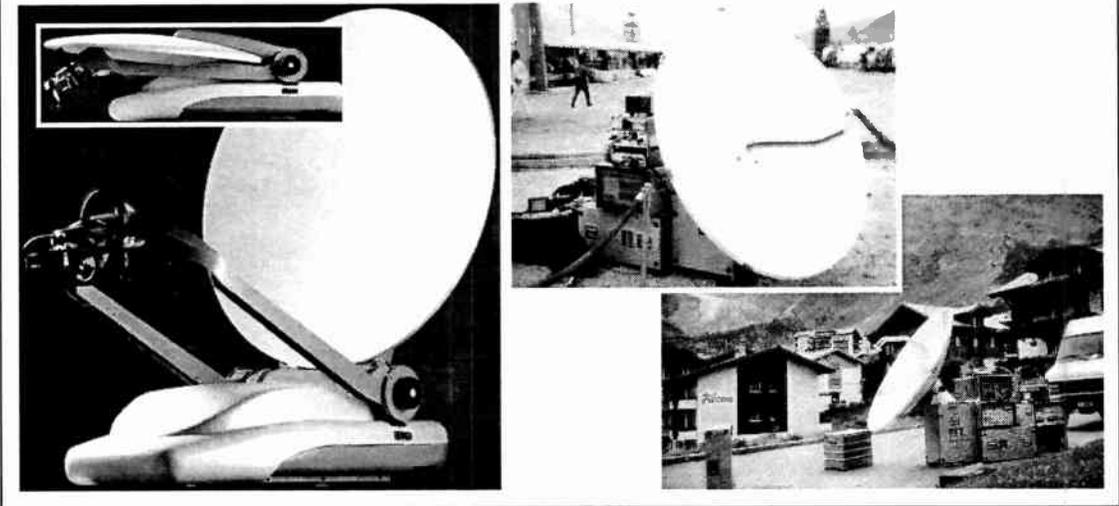
**Flyaways**

**Flyaways**

Refers to a class of small transportable satellite uplink terminal systems used for satellite newsgathering operations often in very remote locations, or for immediate coverage of major breaking news stories. Also used for coverage of planned events, flyaway units are self-contained uplink stations which continually are being improved becoming more compact, lighter in weight, less costly, and producing higher quality signals. Flyaway systems are intended for any application where a satellite uplink stations needs to be quickly deployed for analog or digital transmission including video, audio, telephone, fax, computer data networking. (See SNG)

**Figure 64**

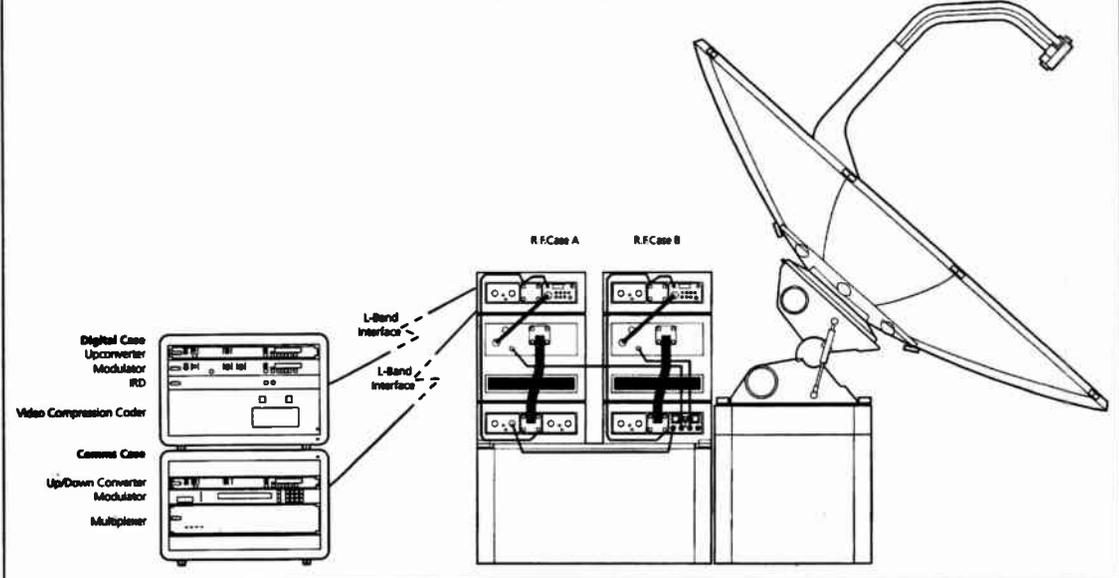
**Examples of Flyaways**



Source: Advent Communications

**Figure 65**

**Semi-Redundant Uplink System Configuration**

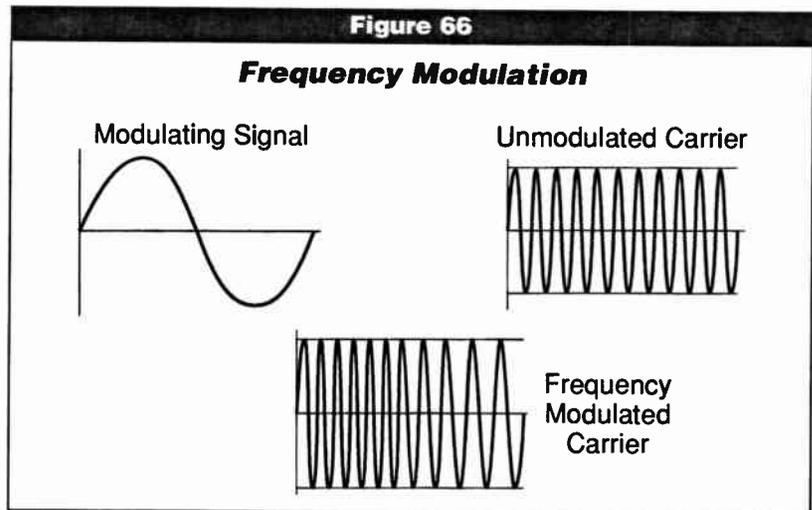


Source: Advent Communications

### FM – Frequency Modulation

A technique that changes the frequency of a carrier so that information can be sent over-the-air and recovered by detecting these changes in frequency. The form of modulation used in the FM radio band (88-109 MHz), and in the aural portion of the television signal. More precisely, a modulation technique in which the carrier frequency is

shifted in frequency by an amount proportional to the value of the baseband input signal.



### FMV – Full-Motion Video

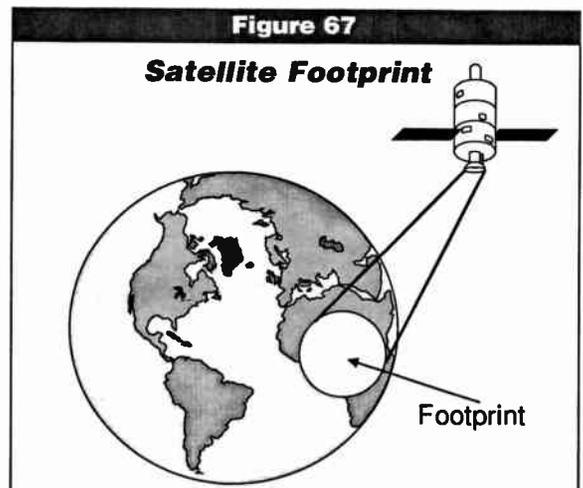
(See Full-Motion Video)

### Footprint

The general geographic area on the earth's surface that is covered by, or is able to receive, a particular satellite signal. Footprint coverage patterns depend on a variety of factors including on-board satellite power, beam shaping techniques, the orbit of the satellite (low earth orbit, geostationary (GEO), elliptical, polar), and if located in geostationary orbit, the position of the satellite along the arc.

### Fourier Transform

A Fourier transform is a mathematical algorithm that is a special way to process signals by using mathematically valid shortcuts to reduce the amount of computing required to transform signals. FT uses a particular methodology to reduce the number of operations in the Fourier transform thus reducing the amount of computations required and making it faster to perform. One application is encoding and decoding COFDM signals. (See COFDM)



Source: NAB

### fps – Frames Per Second

A measure of the number of video picture frames transmitted or displayed in an established period of time. The existing NTSC television standard specified that to create the illusion of continuity a video picture frame must be retraced at a rate of 30 frames per second or 30 Hz. The development of interlaced scanning for television made this practical. Video frames are composed of two fields of picture scan line information and transmitted at two times the frame rate to avoid the perception of any disruptive flicker. (See Field, Flicker, Interlace Scanning)

**Fractal Compression - Frame Store****Fractal Compression**

An advanced compression technique that shrinks a video image into extremely small resolution-independent files that are stored as mathematical equations instead of storing the image as digital pixels.

**Fractals**

Fractals are a type of mathematical modeling that translates the shape of a graphical object into mathematical formulas from which an image can be later constructed or reconstructed. Applications of fractal modeling enables complex graphical designs or computer generated pictures to be created and stored in a computer as mathematical equations.

**Frame**

A single snapshot of video information that when combined with a series of other frames are traced onto a television as video programming or onto a computer as a video display. Consecutive scanned frames at a certain rate create the illusion of continuity that links each image together. In computer file environments, the term frame indicates data is organized as a block of information, which has a beginning and ending flag to signal where the block starts and finishes. A frame can also be used to describe an area of memory in a computer. On the Web, frames refer to a method of displaying information in Web browsers so that multiple boxes, each with its own scroll bars, appear on a single screen. Netscape introduced frames in the second version of its popular Netscape Navigator software and it has since become a de facto standard for website displays. (See Block, Flag, fps)

**Frame Buffer**

A storage area for temporarily holding upcoming frames of video that cannot currently be displayed on a screen for viewing. Also called a frame store, frame buffers are used in both computer and television systems as an interim storage point providing easy, ready access when required by a scanning device such as an electron gun.

**Frame Grabber**

A device used in video editing systems that removes specified video frames in an NTSC analog video signal or tape and moves them to computer memory storage by first digitizing the selected image.

**Frame Rate**

Pictures, or video, are displayed at a specific speed. How quickly or slowly these frames are made available for viewing is the frame rate. Frame rate for NTSC television video is 30 frames per second. (See Frame)

**Frame Relay**

A type of digital data transmission for sending data over public or private leased phone lines. Frame relay systems adhere to a set of transmission standards for Local Area Networks (LAN) and Wide Area Networks (WAN) and uses protocols supporting packetized data switching. Packetized data frames can vary in size and do not contain any error checking mechanisms. The ITU-T (formerly CCITT) and ANSI organizations have established technical standards for Frame Relay systems. (See ANSI, Packet Switching; also CCITT, ITU-T in Appendix)

**Frame Store**

(See Frame Buffer)

### Frames

Process of displaying Web pages in separate framed sections of a display screen. By using special frame codes in their Web pages, website designers are able to build sites that display several different pages simultaneously. To print information from a website that displays contents in frames, Web users must first click inside of the frame they want to print and then choose the print command.

### Freeware

A computer industry term for program software that is offered free — usually downloaded from the Internet. Freeware is not the same as shareware, which also is often available for downloading from the Internet, but shareware is a limited-use promotional product to encourage user purchase of the complete software package. In cases of shareware and freeware copyrights remain with the originator.

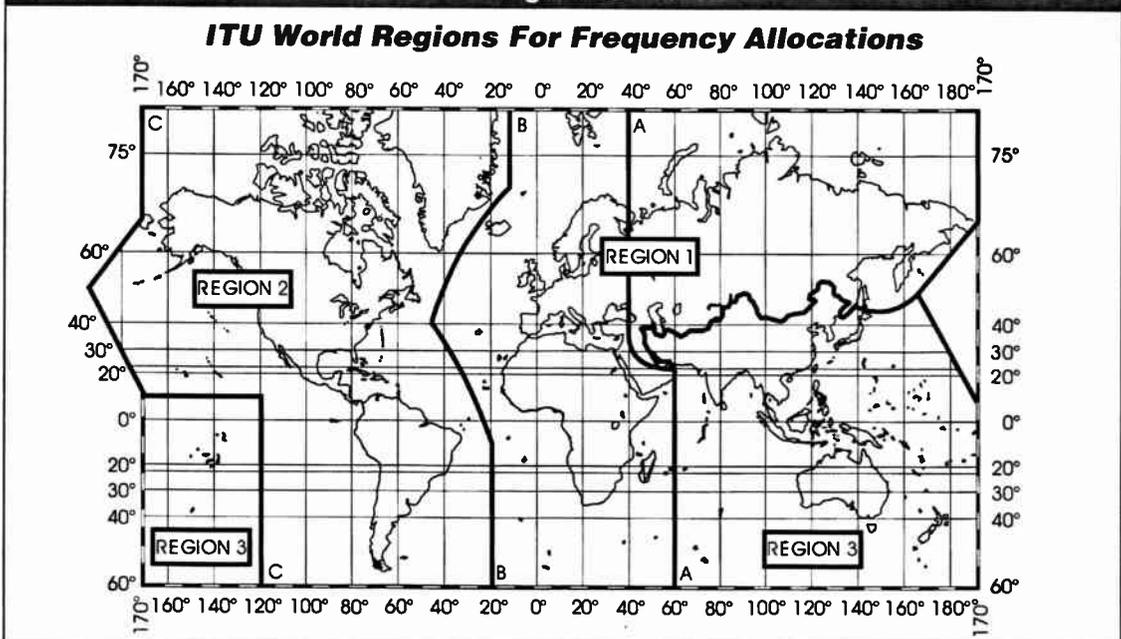
### Frequency

A measure of the number of times an event occurs in a given period. In less complex communications systems, where a signal stays relatively constant such as in AM radio, the frequency of this analog signal is the number of times the sine wave of the signal is repeated during a specific interval of time. Typically, this measure of frequency is calculated for one-second intervals, and is expressed in cycles per second or Hertz (Hz). In digital electronic systems with instantaneous frequencies requiring rapid shifts among channels, or use of many frequencies simultaneously, the concept of frequency is the number of times a signal changes from positive to negative or vice versa per second. (See Spectrum)

### Frequency Allocation

The allocation of spectrum frequencies by the International Telecommunications Union (ITU) divides the world into three Regions. This geographic division supports organizational purposes as well as institutes a certain degree of space diversity to reduce/avoid interference. In the United

Figure 68



Source: ITU/FCC

Figure 69

U.S. Table of Allocations

UNITED STATES  
FREQUENCY ALLOCATIONS

THE RADIO SPECTRUM

RADIO SERVICES COLOR LEGEND

- |                 |                     |               |               |
|-----------------|---------------------|---------------|---------------|
| Primary         | Secondary           | Shared        | Not allocated |
| Fixed           | Mobile              | Radiolocation | Other         |
| Maritime Mobile | Aeronautical Mobile | Land Mobile   | Broadcast     |
| Maritime Mobile | Aeronautical Mobile | Land Mobile   | Broadcast     |
| Maritime Mobile | Aeronautical Mobile | Land Mobile   | Broadcast     |
| Maritime Mobile | Aeronautical Mobile | Land Mobile   | Broadcast     |
| Maritime Mobile | Aeronautical Mobile | Land Mobile   | Broadcast     |
| Maritime Mobile | Aeronautical Mobile | Land Mobile   | Broadcast     |
| Maritime Mobile | Aeronautical Mobile | Land Mobile   | Broadcast     |
| Maritime Mobile | Aeronautical Mobile | Land Mobile   | Broadcast     |

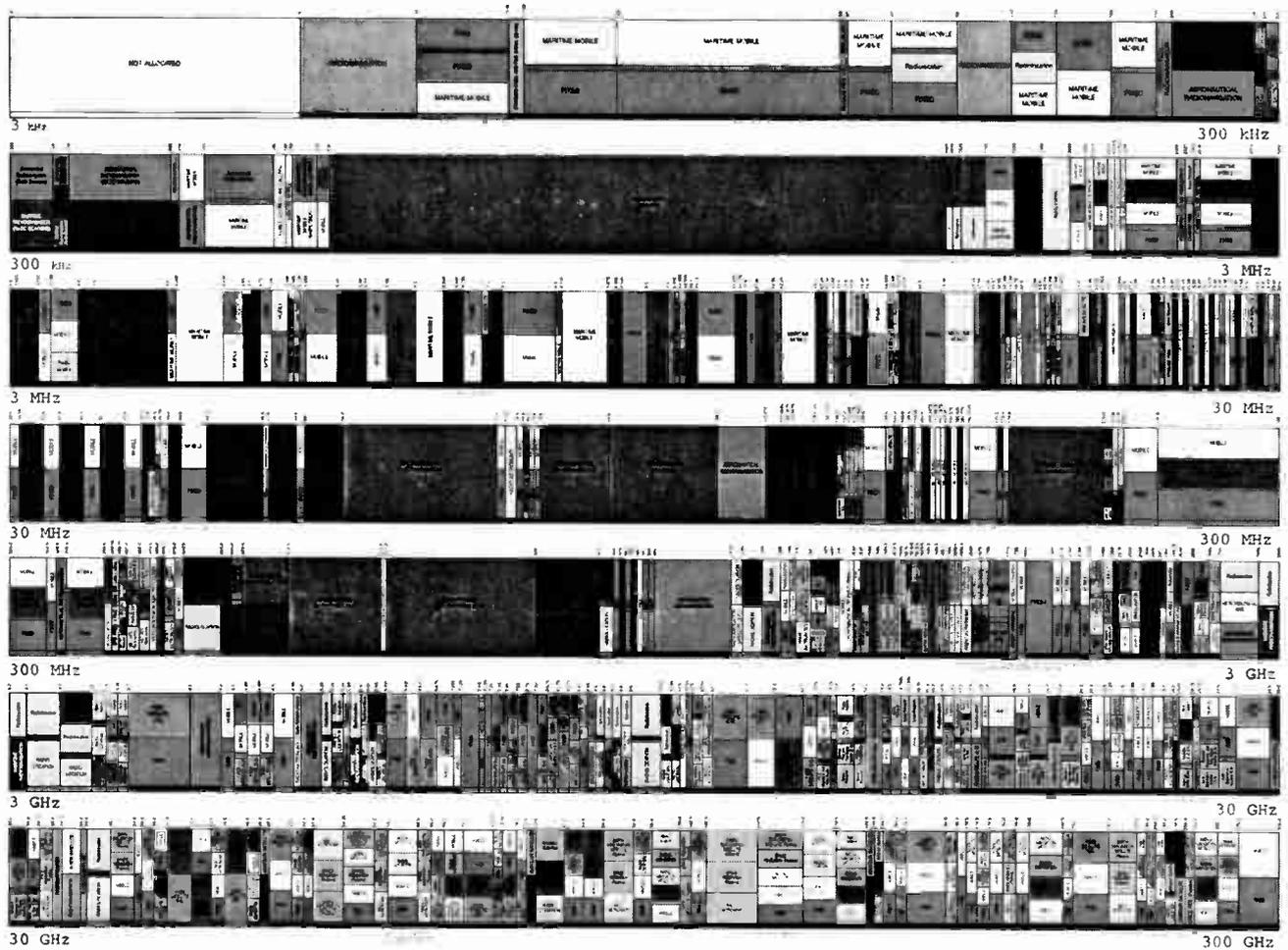
ACTIVITY CODE

- |                 |                     |               |               |
|-----------------|---------------------|---------------|---------------|
| Primary         | Secondary           | Shared        | Not allocated |
| Fixed           | Mobile              | Radiolocation | Other         |
| Maritime Mobile | Aeronautical Mobile | Land Mobile   | Broadcast     |

ALLOCATION USAGE DESIGNATION

- |                 |                     |               |               |
|-----------------|---------------------|---------------|---------------|
| Primary         | Secondary           | Shared        | Not allocated |
| Fixed           | Mobile              | Radiolocation | Other         |
| Maritime Mobile | Aeronautical Mobile | Land Mobile   | Broadcast     |

U.S. DEPARTMENT OF COMMERCE  
National Bureau of Standards  
Radio Frequency and Microwave Administration  
Washington, D.C. 20535



Source: U.S. Department of Commerce

States, the Federal Communications Commission is responsible for assigning licenses for commercial (Non-Government) applications for domestic use, and for certain other commercial applications in accordance with the specifications of the International Frequency Allocation agreements. Government allocations of frequencies are overseen by the NTIA under the aegis of the Executive Branch. Internationally, RF allocations and registrations are overseen by the ITU-T, a division of the International Telecommunications Union (ITU), which incorporates the registration functions of the former International Frequency Registration Board (IFRB). (See FCC, Frequency Allocations Table; and IFRB, ITU-T, NTIA in Appendix.)

### **Frequency Allocations Table**

The Table of Frequency Allocations for the United States comprises the Federal Government Table of Frequency Allocations and the Non-Federal Government Table of Frequency Allocations. The FCC is responsible for allocating spectrum for public and/or private commercial communication services. Examples of services include television, radio, microwave, satellite, and cellular telephone operations. Within a block of spectrum allocated for a service, the FCC also assigns licenses for individual service applications. Using FM radio as an example, the bandwidth allocation for the FM radio service extends from 88 to 108 MHz. The bandwidth allocation for each FM station is 200 kHz. The center frequency of the bandwidth allocated to an FM station is the station's licensed frequency of operation, such as 100.3 MHz. As a result of advances in digital technology, combined with other newer technologies such as spread spectrum, the practice of allocating broad blocks of spectrum to specific classes of service is coming into question as an inefficient use of spectrum resources. Frequency hopping, code division multiplexing, and other coding and compression techniques eventually may lead to a new approach for licensing and assigning spectrum allocations. (See Coding, Compression, Frequency Allocation Table, Spectrum)

### **Frequency Division Multiplexing**

(See FDM, FDMA)

### **Frequency Hopping**

Refers to RF transmission technique being used in new cellular and PCS services based on spread spectrum technology. (See Spread Spectrum)

### **Frequency Modulation**

(See FM)

### **Frequency Response**

A graph of the ability of a circuit to pass each frequency is its frequency response graph. The vertical axis shows the amount of the input frequency that gets through and the horizontal axis shows the frequency. See filter diagrams for theoretically perfect frequency responses.

### **Frequency Re-use**

A systems engineering/design technique allowing the use the same spectrum frequencies used in a particular communications system without introducing interference or other artifacts. Such reuse is due to the basic design of a particular system. Re-use can be based on geographical separation as was the original allocations for radio and television stations across the country. In digital cellular phone system, cells are designed to re-use RF channels within set boundaries. The same frequencies can be used in other cells located not usually adjacent to, but not far away, with little potential for interference. Reuse of frequencies fundamentally is what enables cellular systems to handle huge numbers of calls within a limited number of channels. Frequency reuse schemes also are found in cable, optical broadband and satellite communications systems.

**FSK - Full Duplex****FSK - Frequency Shift Keying**

A method of signal modulation where analog information is converted into digital binary (1's and 0's) form for transmission over telephone lines. By shifting the frequency of an audible tone to correspond to digital 1's and 0's, a receiving modem can determine whether a received binary bit is a 1 or 0. For example, an audible tone of 50 Hz could represent zeros and another tone of 100 Hz would denote ones.

**FSS - Fixed Satellite Service**

Regulatory terminology for satellites licensed to transmit (and receive) communications to fixed or permanent earth station receivers. The FSS designation distinguishes these satellite services from mobile satellite services (MSS) which are transmitted from satellites to receivers attached to mobile vehicles. (See Satellite)

**FTP - File Transfer Protocol**

A protocol or set of rules that determine the way files are transferred between two computers, often via the Internet. This set of rules also designates the way security is handled by requiring remote users to log on to the system and keeping track of those remote users using the system. FTP uses a particular way for a directory to be accessed and changed. FTP operates in the Session, Presentation and Application Layers of the Open Systems Interconnect (OSI) model. (See OSI)

**FTTC - Fiber-To-The-Curb**

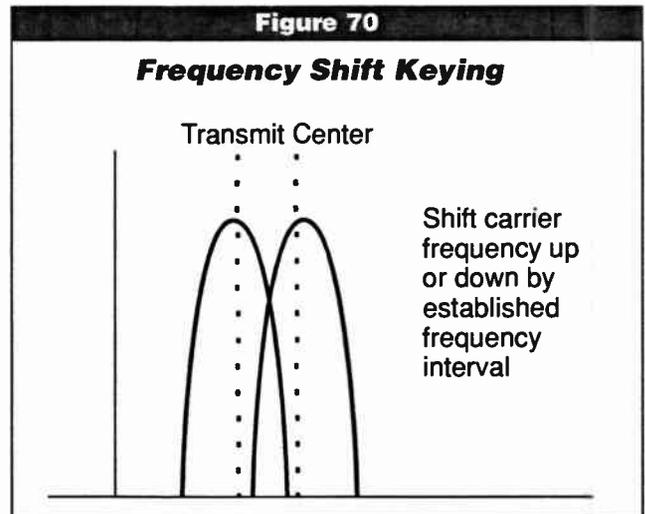
A network topology for new fiber optic-based telephone systems that generally refers to a design to bring fiber capacity to some location just outside of residential homes, or at least to a location that is not far from a central office node. Telephone company plans vary, but such FTTC architectures usually are envisioned as a hybrid of fiber and coaxial cable lines, where coax is used to extend from the fiber end-point to connect with homes. Reasons for hybrid fiber coaxial (HFC) cable designs are economics, and to some extent robustness of coax versus the fragility of fiber inside homes, among others. (See FTTH)

**FTTH - Fiber-To-The-Home**

A telecom network topology that would extend fiber optic cabling directly into residential homes. Once touted as the broadband network of the future, cost considerations, as well as other technical capacity and other considerations have caused the telephone industry to largely drop plans for major deployment of FTTH strategies

**Full Duplex**

Telephone industry term for complete two-way transmission or communication. Full duplex lines enable users to both send and receive information at the same time such as in the traditional plain old telephone service (POTS). Basic two-way interactivity allows users to both talk and listen without any pauses between the two activities.



**Full-Motion Video**

Transmitting and viewing audio/visual information on a computer (computer manufacturers' re-invention of television). The video is actually multiple still images presented in sequence. This is used frequently now with the number of multimedia packages and programs. The program, including the moving video and audio are often stored on a CD-ROM, allowing access to users for listening and viewing. (See Multimedia and CD-ROM)

**Fuzzy Logic**

Originally introduced in the 1960s, fuzzy logic is intended to more closely resemble non-linear human thinking than the older traditional binary logic of "On" vs. "Off" or "Yes" vs. "No" as represented by Boolean logic. In contrast, fuzzy logic systems are built to blur the boundaries between the two extreme states. As a result, advances in fuzzy logic could produce a revolution in artificial intelligence applications by enabling computers to function more like human brains and less like "dumb" machines. (See AI, Animated GIF, Boolean Search)

**gz - Geostationary Orbit****G****gz**

A form of compression used in UNIX systems similar to pkZip/Unzip. (See pkZip/Unzip, UNIX)

**Gain**

1. In RF communications, gain refers to the amount of increase in the strength of a signal after being passed through a signal amplifier. This increase in signal strength is frequently measured in decibels (dB).
2. Gain is also a measure of the amount of signal delivered by an antenna relative or compared to a reference antenna.
3. Less commonly, the ability of sophisticated digital algorithms and signal processors that receive specially modulated signals to increase effectively the desired/to undesired signal ratio which results in processing gain.

**Gateway**

A combination of hardware and software used to interconnect two dissimilar computer systems, thereby allowing the two systems to "talk" to one another. For example, a corporate email system might need a gateway to translate its internal email format to an Internet email format that would then enable transmissions via the Internet. (See Internet)

**Gbps - Gigabits per second**

(See bps)

**GCR - Ghost Canceling Reference Signal**

A reference signal used as a technique to reduce or eliminate the effects of multipath interference that appear as ghosting images in over-the-air television transmissions. Implementing this technology requires the use of a GCR signal that is inserted in the vertical blanking interval of the transmitted TV signal as well as special circuitry in a TV set or set-top converter box to process the reference signal and remove the ghosting. (See VBI)

**Generation**

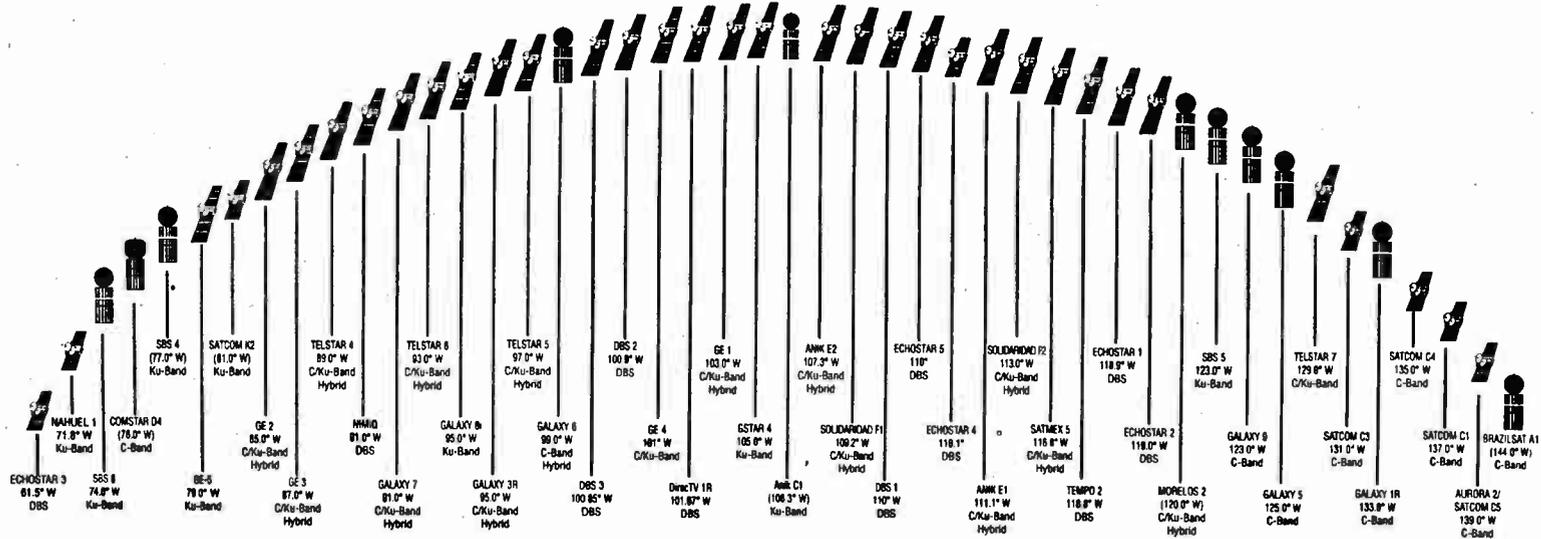
In computer and other electronic communications systems, the term generation is used in a number of contexts. Generally, it relates to successive versions of hardware and software products, or to successive copies of software on tape storage media. Computer hardware, software, other consumer electronic products that have evolved with improvements in design and/or functions are considered new generations of an existing technology. First-generation computers used vacuum tubes and were massive in size. Succeeding generations used transistors, chips, miniaturization, and active matrix LCDs to arrive at today's array of 135+ MHz laptops. In software such as audio or videotapes, generations indicate successive copies of an original or creation of a new generation out of older original versions. In duplication, successive generations of tape quickly degrade or lose quality. This is an underlying reason for growing interest in digital disc-based technologies that do not degrade but pose their own risks for commercial distributors in terms of illegal copying.

**Geostationary Orbit**

A specific earth orbit used for communication satellites in which the satellite remains constantly in the same position relative to a geographical point on the surface of the earth. In this position it appears stationary as seen from earth (geostationary) or traveling at a speed that is synchronous with the daily rotation of the earth on its axis (geosynchronous). The orbit is located approximately 22,300 miles above the equator of the earth. Geostationary satellites allow fixed ground receivers

Figure 71

Satellites in Geostationary Orbit



**GIF - GIS**

(dishes) to be pointed at the same place in the sky as the satellite remains in the same location in relation to the movement of the earth. (See Clarke Belt)

**GIF - Graphics Interface Format**

An established proprietary format used as an interface in converting a graphical image (or picture) into a compressed digital form. This form enables computer processing of the image data. GIF files (pronounced "Jiff") enable a computer to display the image on a monitor and also print the digital image. Another method of converting graphical, picture, or video images into a format that a computer can read is called "Tagged Image File Format," or TIFF; however, more common on the Internet are JPEG files (Joint Photographic Experts Group). (See Animated GIF, JPEG, PNG, TIFF)

**Gigabit (Gb)**

One billion digital bits. (See Bit)

**Gigabit Ethernet**

The newest version of the computer network Ethernet system protocol, which supports data transfer rates of 1 Gigabit or 1,000 Megabits per second. The first Gigabit Ethernet standard was adopted in 1998. (See Ethernet, CAT-5)

**Gigabyte (GB)**

One billion bytes. (See Byte)

**Gigahertz (GHz)**

A radio frequency operating at one billion Hertz or cycles per second. Also used as a relative measure of the bandwidth capacity of a communication channel. (See Bandwidth, Hertz)

**Gigapop**

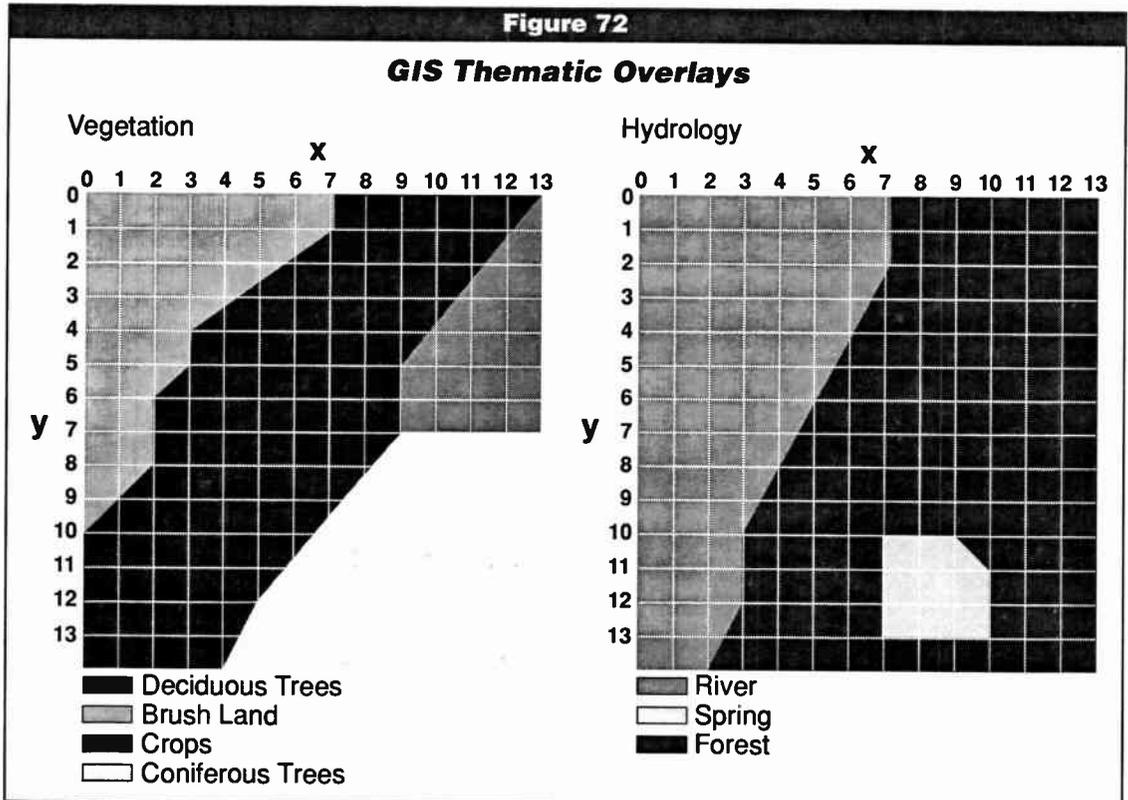
Refers to point-of-presence (POP) sites operating at one gigabit-per-second. Gigapops will serve as one of the key technologies to support the high bandwidth capacity of the "Next-Generation Internet" currently under development. Gigapops are primarily used to connect one network to another network and are designed for routing high-speed network traffic over large geographic areas. (See Internet 2)

**GII - Global Information Infrastructure**

An initiative to provide an integrated system for electronic connectivity — to/from anyone, to/from anywhere — in order to share access to the wealth of information, resources, and services available around the world. Future plans for the design, implementing, upgrading, or construction of advanced networking systems and services. A GII Committee is working with public and private sector input to help developing countries create information infrastructures that will enable them to keep pace with advanced information systems in more developed countries. The GIIC also works to help develop public policy that will advance the fields of telecommunications and information delivery. Facilities, services and even political and regulatory structures in countries around the world, are being affected by GII efforts.

**GIS - Geographic Information Services**

Refers to a segment of the emerging earth imaging/ remote sensing industry resulting from the development of high-end digital computer data and graphics processing capabilities. GIS companies collect, store, and create massive databases that can be queried, accessed and manipulated



Source: Logicon

and produce diverse sets of geographical mapping data in electronic form. Systems often integrate RS imaging data and GIS geographical and thematic database information (e.g., vegetation acreage, croplands, watershed drainage areas, transportation, powerline, or underground cabling networks. (See DGPS, GPS, Remote Sensing, Thermal Mapping.)

**Globalstar**

Globalstar USA, a subsidiary of Globalstar Communications, Inc., initiated full commercial availability of its global mobile satellite service throughout the North American continent in 1Q2000. Consumers have access to seamless voice and other services coast-to-coast with international roaming set to begin imminently. Globalstar USA is a subsidiary of Vodafone Airtouch. Major terrestrial wireless services provider, QUALCOMM introduced a new modem receiver for use with the Globalstar system (GSP-1620 Satellite Packet Data Modem.) The modem is designed to deliver digital data communications for urban and remote areas, using QUALCOMM's digital CDMA technology. (See CDMA.)

**GMT - Greenwich Mean Time**

Historically, the longitudinal line running through Greenwich, England was designated as the reference point for determining relative time in other time zones around the globe. Twenty-four time zones corresponding to measured longitude degrees corresponding to one-hour increments from the GMT reference. GMT is not often used today in favor of a more precise term, UTC for Coordinated Universal Time. (See UTC)

## Gopher - Grade B Contour

### Gopher

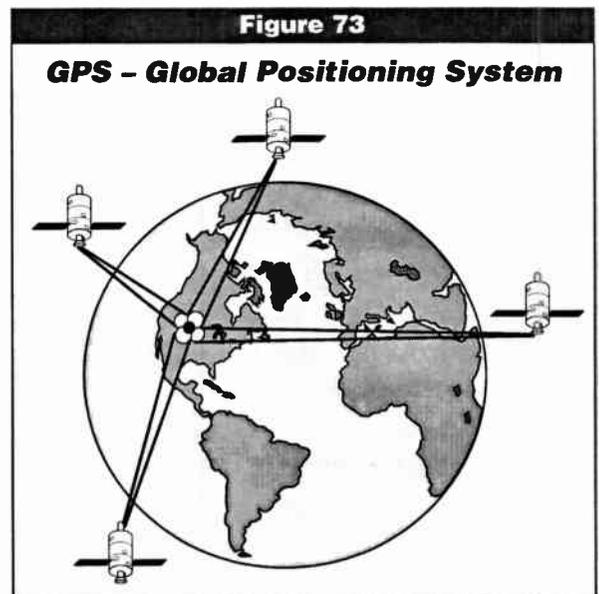
The once widely used method of making menus of material available to locations or addresses on the Internet in the 1980s and early 1990s, gopher services are still available but have been largely supplanted by the growing popularity of the World Wide Web. Gopher is a text-only environment that uses a menu-based system to provide access to networked information.

### GPI Trigger - General Purpose Interface Trigger

A function that performs like a play button in various electronic video processing devices such as character generators, switchers, or video editing units. A GPI trigger allows a user to precisely indicate when in a time sequence a particular action will be performed by the device. An advantage of this type of interface command is to ensure a higher degree of accuracy when performing video editing or inserting text titles in a video segment. (See Keying)

### GPS - Global Positioning System

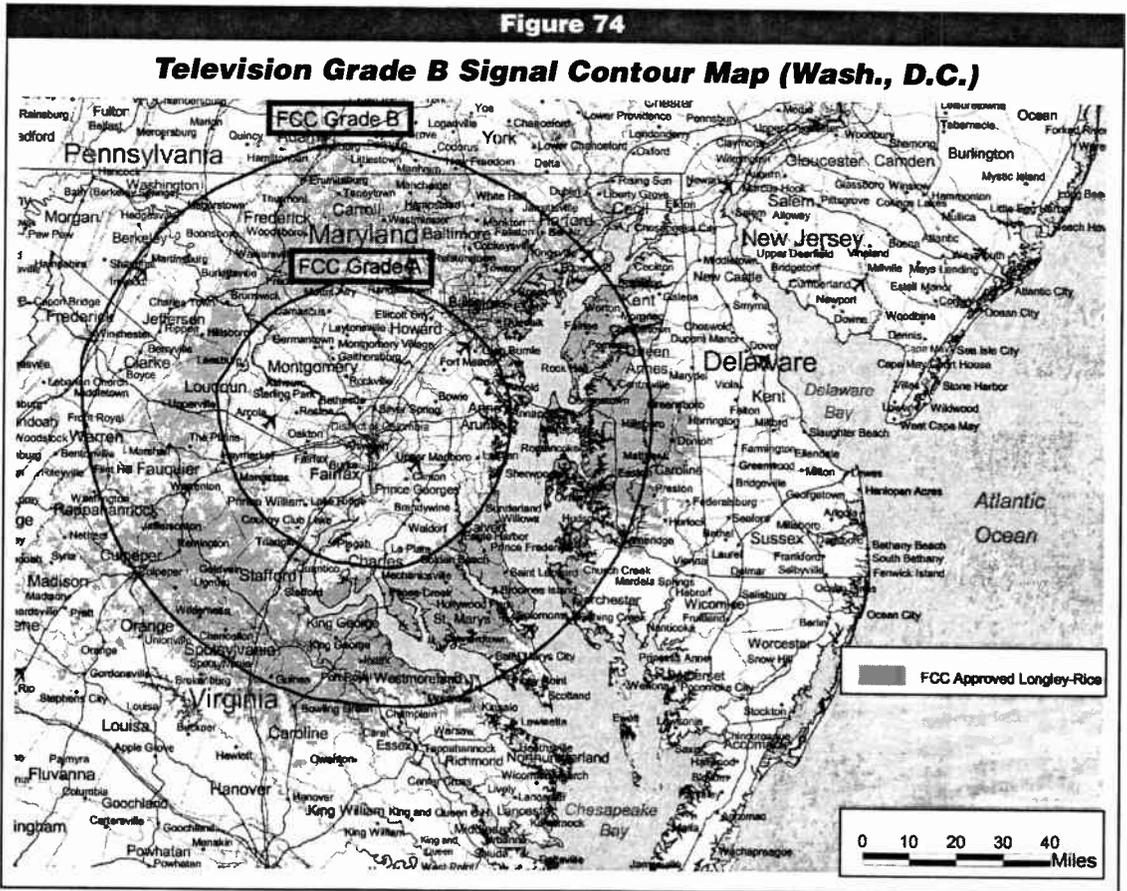
U.S. NavStar fleet of 34 satellites used for precision pinpointing of geographic positions located anywhere on the earth's surface. An intentionally degraded version of the military GPS data is made available for commercial applications. The degraded version of GPS data is enhanced in a technique called Differential GPS to increase accuracy down to 10 meters. Positioning data at this level enables it to be used for a variety of services such as vehicle and truck fleet tracking purposes, or for potential use in the Intelligent Vehicle Highway Systems (IVHS) for car navigation and directional purposes. Future applications will include new automobile location/mapping/positioning services to be delivered via radio/TV datacasting services, among others. Existing GPS receivers can access signals from three satellites. More advanced GPS receivers, at higher costs, are able to pick up signals from four or five satellites, thus able to create more accurate location information. (See DGPS)



Source: NAB

### Grade B Contour

Represents the signal coverage area of an analog television station in the U.S. established according to a set of certain technical criteria. "Grade B" service represents a specific value of ambient median field strength at 30-feet above the ground which is deemed to be sufficiently strong – in the absence of a man-made noise or interference from other stations – to provide a picture quality which the median (average) observer would classify as "Passable" quality, assuming a receiving installation (antenna, transmission, line and TV receiver) considered to be typical for use in outlying or near-fringe areas. A Grade B signal contour represents the outer geographic limits within which the median field strength equals or exceeds the Grade B value for the designated channel grouping as specified by the FCC. (See Longely-Rice)



Source: Dataworld, Inc.

**Grand Alliance**

A consortium including AT&T, David Sarnoff Research Center, General Instrument Corporation, Massachusetts Institute of Technology, Philips Electronics North America Corporation, Thomson Consumer Electronics, and Zenith Electronics

Corporation. The Grand Alliance was formed after the initial round of competitive testing of advanced television systems did not show one proponent system to be significantly superior to the others. The group resolved their differences and the Grand Alliance developed the HDTV prototype equipment that was documented by the Advanced Television Systems Committee (ATSC). After laboratory testing was completed, the Grand Alliance system was formally recommended by the FCC's Committee on Advance Television Systems (ACATS) to the FCC in 1995 for adoption as the United States standard for digital television. (See HDTV)

**Table 24**

**Television Grade B Service**

	Television Channels	Grade B Service Median Field Strength Value*
VHF	Channels 2 – 6	47 dbu (0.22 mv/m)
VHF	Channels 7 – 13	56 dbu (0.63 mv/m)
UHF	Channels 14 – 83	64 dbu (1.60 mv/m)

\* Appendix B – Technical Specifications, FCC's Third Notice of Further Proposed Rule Making Dockets 8736, 8975, 8976, 9175.

## Graphics - Ground

### Graphics

A type of visual information that can be created, stored, received, and manipulated as data in a computer. Graphics include letters as well as pictures.

### Graphics Adapter

A graphics adapter (also called a video graphics adapter or video adapter) is an interface between a computer and a display device, such as a monitor. A graphics adapter converts video information from its original form to one that is acceptable on the display screen. Different graphics adapters are able to support different quantities of different colors and color palettes as well as different levels of visual resolution. The graphics board must match the output of the video display monitor or it must support higher resolutions or color information than the display being used. For example, a graphics board with color capabilities can be used in conjunction with a black and white monitor, but not the reverse. Below is a breakdown of some common video graphic adapters and their formats. (See AGP)

**Table 25**

### Video Graphics Adapter Standards

Name	Standard	Resolution (Horizontal x Vertical) (in pixels)	Horizontal (kHz) Bandwidth	Vertical (Hz) Bandwidth	Interlace Scanning Ratio	Signal Type
NTSC	RS-170A RGB	Based on Bandwidth	15.750	60.00	2:1	Color Analog
HERC	Hercules	720 x 348	18.430	60.00	1:1	Mono TTL
CGA	Color Graphics Adapter	640 x 200	15.750	60.00	1:1	RGBI TTL
EGA	Enhanced Graphics Adapter	640 x 350	21.850	59.70	1:1	RGBrgb TTL
VGA	Video Graphics Array	640 x 480	31.470	59.84	1:1	RGB Analog H&V
SVGA	Super VGA	800 x 600 1,000 x 1,000 1,800 x 1,240	35.20	59.84	1:1	RGB Analog H&V
IBM	IBM Proprietary 8514/A	1024 x 768	35.520	86.96	2:1	RGB Analog H&V
XGA	Extended Graphics Adapter	1024 x 768	38.00 48.00 57.00 64.00	431 60.00 70.00 75.00	1:1	RGB Analog H&V

Source: NAB

### Ground

In communications systems, refers to a conducting connection (whether intentional or not) to the earth. This establishes the reference for measuring voltages. All circuits need return paths for the current they use, and sometimes this is via the ground. One purpose of grounding is to provide a path for unwanted electromagnetic energy to go to the ground instead of into a circuit, possibly

disrupting the operation of that circuit. One example of unwanted electromagnetic energy is that from a lightning strike.

**Groupware**

Network software that allows groups of people to work together on common document files, schedules, CAD/CAM graphics, etc. (See Exchange Server, Workgroup Computing)

**GSM - Global Systems for Mobile Communications**

A transmission standard developed and adopted in Europe and other global regions for digital mobile cellular phone services. A developing U.S. GSM standard operates at a slightly higher frequency. (See 3G, Cellular Telephone, PCS, Wireless Networks)

**GSO - Geostationary Orbit**

Alternative shorthand designation for a satellite in geostationary (GEO) orbit.

**GUI - Graphical User Interface**

A type of computer interface or front-end overlay developed as a more graphics-oriented, user-friendly format for personal computers. Users are able to access, manipulate, and perform most other tasks using a pointing device (e.g., mouse) to activate commands by clicking on visual representation of functions called icons. GUI front-end overlay programs have replaced text-only menu systems and even older keyboard typewritten command functions in personal computers systems. Graphic interface programs such as Windows are more intuitive for users thus making computers more widely used appliances for performing a range of work and personal/home tasks. (See Icon)

**GW - Ground wave**

An effect found in radio transmissions where radio signals propagate with increased strength as result of traveling along the earth's surface. Radio signals with wavelengths longer than line-of-sight waves, yet shorter than waves refracted in the ionosphere propagate with a ground wave component. (See Propagation)

**HAAT - Handwriting Recognition**

H

**HAAT - Height Above Average Terrain**

Measure of elevation calculated from the level of nearby surrounding terrain. This is used most often in antenna tower constructions and the formula for measurement is defined by the FCC.

**Hacker**

The term originally was used to describe a serious computer user. Now it refers to a person who gains unauthorized access to a computer system (usually from a remote location) and then tries to take control of some aspect of that computer, make changes to it, or access information that's contained on it. Many hackers try to break into computers purely for the challenge; others (also known as "crackers") do intentional harm and/or steal information. One of the most famous hackers of all-time, Kevin Mitnick (a.k.a. "Condor") was arrested in February of 1995 and after four years, five months and 22 days Kevin Mitnick was finally sentenced on August 9th in U.S. District court to 46 months in prison. He was also ordered to pay \$4,125 in restitution. This was a mere fraction of the \$1.5 million that the government wanted him to pay. (See Trojan Horse)

**Handheld**

An increasingly popular and useful set of batter-powered palm-sized computers/digital devices that perform everything from basic scheduling to wireless email communications and Web browsing. (See Internet Appliance, Palm-top Computer, PDA)

**Handset**

Typically hand-held apparatus or device used in voice communication systems consisting of a receiver and a transmitter enabling users to both talk and listen. The handset is the physical portion of a telephone held by the user. When the handset is lifted from its cradle or hook a direct current (DC) connection is activated signaling the local switching system at the nearby Central Office (CO) to activate dial-tone or connect an incoming call and stop the phone from ringing. (See CO, DC)

**Handshaking**

In communications systems, this refers to the initial signaling that takes place between the sending device and the receiving device on a network to determine whether the receiver is "busy" or "idle." The confirmation of an open channel is called a handshake, as it can be compared to physical handshake greetings. In data networks, the handshake greeting also sets the rules for following interaction. Handshake procedures also are used by computers in making contact with peripheral devices such as printers or modems prior to downloading file signals.

**Handwriting Recognition**

Ideally, a technique developed to eliminate the need for using keyboards to input information into a computer. Handwriting recognition systems today are still relatively primitive. They are

**Figure 75****Handheld Wireless**

*Small, light,  
wireless  
advanced  
equipment  
for people  
on the go...*



Source: Money Magazine, December 1999

most commonly used on Palm-top computers and require that the user substitute their usual handwriting characters for specially programmed symbols. While such systems are becoming more and more popular, many people prefer to use keyboards because they are faster and more efficient in most situations. (See Handheld, Palm-top Computers)

### Hard Disk

Permanent memory capacity built into a computer or, at times, attached as a peripheral storage device to a computer. Hard disks are used to store large quantities of information in digital form and typically are used for more permanent storage rather than less robust storage media such as floppy disks. The operating system software and other applications software are usually stored on the hard disk for rapid access. A type of external peripheral hard disk is a Redundant Array of Independent Disks (RAID) which contains multiple storage platters or disks. (See RAID)

### Hard Drive

In computer lexicon, the term hard drive actually means hard disk drive and is used interchangeably with hard disk. A hard drive is sometimes abbreviated as HDU (Hard Drive Unit) in contrast to FDU for a Floppy Disk Unit. (See Hard Disk)

### Hardware

The physical equipment components of a computer or other electronic communications system including computer central processing units (CPUs), keyboards, monitors, hard disks, also peripheral equipment, printers, servers, switchers, character or graphics generators, CD-ROMs, speakers, etc. Essentially, all physical equipment, components, devices, systems, network plant, or other physical electronic assets. (See Software)

### Harmonic Distortion

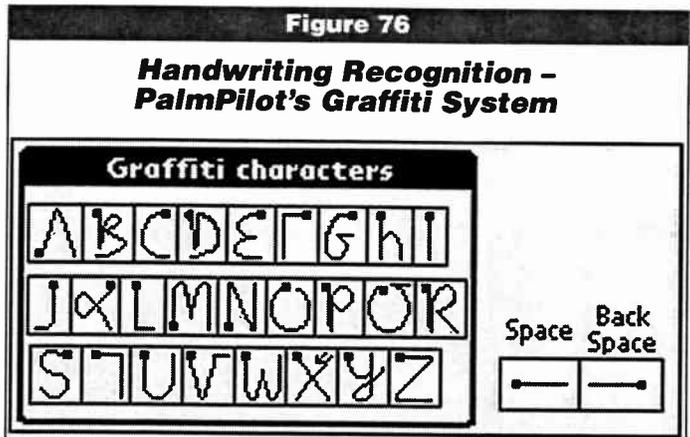
Literally a distortion or altering of a signal. If a single frequency is put into a device and other frequencies come out in addition to the input signal, harmonic distortion has occurred.

### Harmonics

Harmonics are multiples of a base or fundamental frequency. For example, a base frequency of 100 MHz could have harmonics of 200 MHz, 300 MHz, and 400 MHz. Generally the higher the multiple, the smaller the energy in the harmonic. In electronic systems they are generally undesired and are produced because electronics are not perfect. However, these imperfections, or nonlinearities can be used to create harmonics if that is desired.

### HARP - High-gain Avalanche Amorphous Photoconductor

A new type of image sensor for video camera tubes which make them 10 times more sensitive to light than conventional tube types and are particularly useful in low-light outdoor filming and may offer solutions for sensitivity drawbacks of HDTV cameras.



**HASL - Header****HASL – Height Above Mean Sea Level**

Basically, this refers to elevation and is a measurement of how high an object is raised above a reference point, in this case sea level. This measurement is used in three-dimensional Global Positioning Systems (GPS) providing users positioning data not only in latitude and longitude, but also in elevation. GPS elevation is measured from an elliptical model of the earth as opposed to normal elevation from sea level. A mathematical equation is used to convert between GPS elevation and normal HASL. (See GPS)

**HBI – Horizontal Blanking Interval**

A specific interval in standard NTSC television broadcast signals which is created at the end of each scanned video line when the video signal is briefly turned off to allow the electron gun generating the television display image to return to the right side of the screen without retracing over the previous video line. Horizontal blanking intervals at times are visible as black portions seen on either side of a television picture. During this interval, a color burst signal also is generated establishing a reference for demodulating the color or chrominance portion of the TV signal. (See Interlaced Scanning)

**HDSL – High-bit rate Digital Subscriber Loop**

A telephone industry technique for transporting data at high rates over voice-grade twisted-pair copper wires. Transmitted at speeds up to 2.048 Mbps, HDSL was developed to increase the utility of telephone company T-1 lines and ISDN services. HDSL does not need repeater devices to regenerate signal strength, which helps bring down service costs. (See ISDN, T-1)

**HDTV – High Definition Television**

Digital television technology and broadcast transmission standard being implemented in the U.S. to provide sharper broadcast pictures, multichannel digital sound, and immunity from interference such as ghosting. HDTV system proposals were evaluated by the FCC's Advisory Committee on Advanced Television Service (ACATS) and eventually merged into a combined system called the Grand Alliance. The video aspect ratio will be 16:9 thus the display of HDTV pictures will be similar to the wide-screen format used in motion pictures. The Grand Alliance's digital system supports a range of video picture resolutions and uses a compression scheme enabling HDTV signals to be transmitted within the same 6 MHz per channel now used for NTSC television transmission. (See Aspect Ratio; DTV, DTV Sets; and Grand Alliance in Appendix)

**Headend**

Cable television industry term for the main facility used for generating cable television system signals. Typically, the headend also is where one or more satellite antennas are installed to receive a variety of cable network signals.

Headend equipment typically includes antennas, frequency converters, modulators and demodulators. (See Cable)

**Header**

A generic term that most often refers to the portion of an electronic

**Figure 77****Example of an E-mail Header**

Header →	<p>From: jdoe@nowhere.com          To: bgoogle@whatever.com          Subject: Re: Your recent email          Barney,          I appreciate you getting back to me so quickly . . .</p>
----------	--

Source: NAB

mail message that precedes the body of a message and contains, among other things, the sender's name and e-mail address, the date and time the message was sent, and routing information. Header information is essential for tracing the source of an electronic mail message. (See Email)

**Hercules**

One of the first monochromatic graphics cards developed for use in personal computers. Hercules utilized a black and white format with a video picture resolution of 720 x 348. (See Graphics Card)

**Hertz (Hz)**

The unit of measurement for the frequency of an electromagnetic signal (sine wave) where one Hertz represents one cycle per second. Cycles refer to the number of times a complete wave is generated or transmitted in a given period of time. If a signal is made up of very long waves, it will have relative few cycles per second. In comparison, a signal such as a microwave has a great many repetitions of its wave cycle per second. The electromagnetic spectrum is divided into bands based on the frequency or number of wave cycles per second, and expressed in terms of Hertz. For instance, VHF broadcast television operates in a range of 30,000 Hz or (30 MHz) to 300 MHz. (See Frequency, Spectrum)

**Hexadecimal**

A numbering system based on 16 different elements (base 16) instead of our common decimal numbering system that uses 10 digits (base 10). Hexadecimal notation systems use numbers 1 through 9 and the letters A through F and most frequently are employed in computer memory addressing systems.

**HF - High Frequency**

A portion of the radio frequency spectrum that ranges from 3 MHz to 30 MHz and is used for military transmissions. (See Spectrum)

**HFC - Hybrid Fiber Coax**

Refers to a combined or hybrid fiber optic and coaxial cable network that is being adopted by the telephone companies (telcos) for future infrastructure upgrading. There has been a major shift in telephone industry strategy toward the upgrading of its copper twisted-wire plant to a new broadband system. The telcos once endorsed a pure fiber optic star-switched network topology but have shifted to support a hybrid fiber coax (HFC) strategy for cost savings and other reasons. A broadband platform will enable telcos to provide a range of video-on-demand as well as other new interactive information services

**High-Performance Computing**

Refers to a branch of computer science that focuses on developing supercomputer hardware and software that is often used to work on high-speed computer networks. High-performance computing often depends on the development of individual software programs that can be divided into small pieces so that each piece can run simultaneously by separate computer processors. (See CPU, Supercomputer)

**High-Speed FM**

Innovative high-speed digital data transmission techniques being developed for use with FM radio subcarriers. (See High Speed Subcarriers)

**High-Speed Subcarriers - Home Page****High-Speed Subcarriers**

Refers to techniques that enable digital FM subcarriers to operate at much higher data rates than supported by RBDS. Two modes of high-speed data transmission are specified as "low band" and "high band" systems. In low band mode, the high data rate transmissions will be compatible with both RBDS (at 57 kHz) and 92 kHz subcarrier services. In the high band mode, the high-speed subcarrier will be compatible with the RBDS subcarrier and an existing 67 kHz subcarrier. These services are expected to provide about 10 kbps. There have been demonstrations of systems that deliver up to 200 kbps.

**Hit**

In the cyberworld, a hit is a request made when a user visits a website whether any desired information is found or not. However, each graphic or ad view link on Web page may count as a hit. When a user requests a Web page using a URL a computer server is contacted and it locates the requested page on a hard drive (storage disk). The requested page is transmitted via the Web to the user's "client" computer system and downloads the graphical elements and text to build the page. Often the loading of each individual graphic on a page is considered a "hit" As a result, the number of hits has little, if any, relationship to the number of different users, visitors, or pages viewed, and thus is not considered a reliable measure of Web advertising exposure.

**HLT - Home Linking Technology**

A proprietary operating system under development since early 1999 by Sunbeam Corporation to create "smart appliances" for "smart homes". HLT uses embedded network technology and low-cost microprocessors from ZiLOG to enable communications links from smart appliance to other smart home products through use of the power line infrastructure in a house. Where battery-operated products are used, the home linking technology uses RF signals for information transmissions. Such signaling services could be part of future datacasting services provided by DTV stations. (See Smart Home)

**Holographic Signatures**

Similar in purpose to "Encrypted Containers," holographic signatures embed hidden tags, sometimes called "digital watermarks," in graphics, images, sound recordings, movies, videos, and animations that enable illicit copies to be traced to their source. This approach cannot be used for software programs or computer-generated text files because the signature would actually alter the documents or inject errors into the computer program. (See Encrypted Containers)

**Home Automation**

Refers to trends in automating certain household functions through computerized systems to control lighting, heating, air conditioning (HVAC), security systems, and home entertainment systems including audio and video equipment. Access could be managed via a central control unit in a separate box, a home computer, or even through a remote control graphical interface menu on a television set. The number and scope of tasks to be controlled through automation systems will vary by products, manufacturers, and user's needs. (See Smart Home)

**Home Page**

Top-level entry point ("page one") of a website for an individual, institution, organization, or possibly a subject area. Home pages often have a "URL" consisting of just the hostname, (e.g. <http://www.nab.org>.) All other pages on a website usually are accessible by following jumps or hot

spot links from the home page to other sections of the site. (See Domain Name, Hosting, Hot Spot, Website , URL)

### Host Computer

Refers to a computer that acts as a source of information or data transmission signals. A host can be almost any type of computer from a centralized mainframe acting as a host to related terminals, to a server that performs as a host for its client terminals, to a desktop PC that is host to its peripheral equipment. In network architectures, a client station (a user's desktop or PC) also is considered a host as it acts as a source of information to the network in contrast to a device such as a router or network switch that merely re-directs data traffic.

### Hosting

Internet Service Provider (ISP) typically offer to rent space on their computer Web servers to hold the contents of a client's Web pages thus allowing quick connections via the Internet. The process of holding and maintaining Web pages using special software and hardware is called "hosting." Data is stored on a host computer or a computer on which a client rents space for the delivery of their Web pages. Hosting also may include other services in addition to Web access. Hosting services can include FTP, Telnet, chat services, e-mail services, database services, audio and video streaming applications, and other new interface technologies that connect to the Internet. Different hosts, or Internet Service Providers, offer better quality connections than others, and the software, computers and prices for ISP hosting depend on the reliability of the network, the range of services required, and the popularity of the website. (See Chat Room, Forum, FTP, Host, Internet Service Provider, Newsgroup, Telnet)

### Hot Spot

Refers to the icon, image or other boxed section on a Web page sensitive to mouse clicks for immediately linking or transferring a user to a separate portion of the same site, or even to a separate website.

### HPA - High-Power Amplifier

A type of amplifier used by satellite earth station's to infuse signal transmissions with the extra power needed to reach satellites in space. HPAs commonly are used with earth stations transmitting to communications satellites in geosynchronous orbit over 22,300 miles above the earth and signals need to be amplified or increased in strength to travel this distance. (See Amplifier, GEO)

**Figure 78**  
**Example of a Home Page**

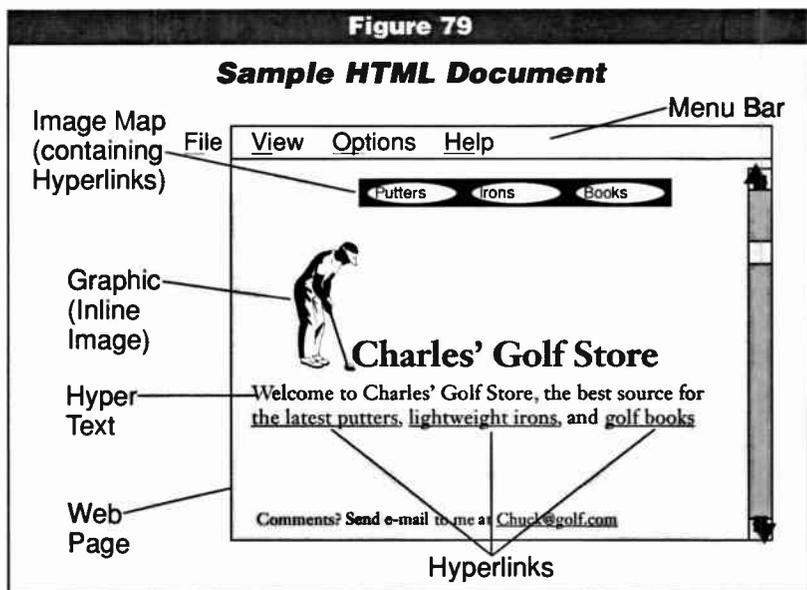
The screenshot shows the Wall Street Journal's website interface. At the top, it displays the date and time: "8:59 p.m. EST, Tuesday, March 14, 2000". The main headline area is titled "What's News - Business and Finance". Below this, there are several news items with brief summaries and expandable sections. For example, one item is "BIOTECH STOCKS tumbled Tuesday" which mentions the Nasdaq composite dropping 200.81 points. Another item is "Clinton May Ease Trade Sanctions On Iranian Imports" which discusses U.S. sanctions against Iran. A third item is "Tribune Deal Puts Cross-Ownership In the Cross Hairs" which reports on a deal between Tribune Co. and the New York Times. There are also sections for "WORLD-WIDE", "PAGE ONE", and "For Each Airline, Flying Is Different Inside the Cockpit". On the left side, there is a vertical menu with categories like "FRONT SECTION", "MARKETPLACE", "MONEY & INVESTING", "TECH CENTER", "SPORTS", "PERSONAL JOURNAL", "FAVORITES", and "ADDITIONAL". On the right side, there are search boxes for "Article Search", "Quote Search", and "Company Research", along with a "Special Offer" for a "FREE Daily Personalized E-Mail".

Source: The Wall Street Journal

## HTML - Hybrid Network

### HTML - Hypertext Markup Language

Refers to a standardized coding language used to create hypertext documents for use as home pages or other text documents on the World Wide Web. HTML appears like old-fashioned typesetting code where text blocks are bracketed with codes indicating how they should appear to a viewer. HTML allows home page creators to attach navigation tools, multimedia data, and hyperlinks to other home pages, in addition to text information. (See Home Page, Hypertext, Mark-up Languages, World Wide Web)



Source: NAB

### HTTP - Hypertext Transport Protocol

The standard file transfer protocol for the World Wide Web on the Internet. To identify that hypertext transport protocol is used as the method of file transfer at a specific website, a code is inserted at the beginning of addresses. For example, the address reading: <http://www.nab.org> indicates that Web users transferring files to this Internet address will reach the National Association of Broadcasters. (See FTP)

### Hub

A central point on a telecom or other communications network where numbers of circuits, signals, or other lines are interconnected. Hubs can be classified into two major categories — dumb hubs, and smart or intelligent hubs. A dumb hub is a passive device that essentially relies on instructions issued from outside sources. Intelligent hubs process and initiate functions because they are active devices containing their own CPU, or computer logic.

### Hue

Hue refers to the color value of a particular object and is one of the two attributes of chrominance in video production and transition systems. A color wheel demonstrates that as the value of a color changes it is hue that is the principle changing factor. Intensity of color or different shades of the same color are in reference to white and are related to saturation not basic hues. (See Chrominance, Saturation)

### Hybrid Network

A type of network that is made up of different components working in a coordinated structure to accomplish a designated mission. Hybrids can be in the form of analog equipment attached to a network of digital equipment, or public networks connected to private networks. There has been a major shift in telephone industry strategy in upgrading its network of copper plant to a broadband system capable of transporting interactive video-on-demand as well as other new informa-

tion services. The telcos once endorsed a pure fiber optic topology but now are supporting a hybrid fiber coax (HFC) network platform. (See HFC)

**HyperCard**

A type of software used to arrange computer documents into virtual stacks for storage and retrieval on Apple Macintosh systems. HyperCard is a Macintosh version of hypertext in which a set of stacks consists of cards, each containing its own information. HyperCard contains its own programming language, which allows users to develop further applications and provide linkage between documents on the Internet. (See HTML, HTTP, Stack)

**Hyperlink/Link**

A reference (link) from some point in one hypertext document to another hypertext document (either on the current website or on another website). Links can also refer to different places within a single document. A browser usually displays a hyperlink in some distinguishing way, e.g. in a different color, font or style. When the user clicks on the link the browser will call up and then display the target of the link. (See Hypertext)

**Hypermedia**

Used as another term for “multimedia,” but it more precisely refers to the multimedia content delivered via the World Wide Web through Hypertext Mark-up Language (HTML). (See Mark-up Language)

**Hypertext**

A computer software technique allowing users to move directly from one location to another location in a document, file, system, or CD-ROM or, most commonly, to surf the Net. Hypertext applications allow users to determine the path to be followed through the document and are used extensively when jumping from website to website. Hypertext is a critical part of the HTML programming language used in creating “Home Pages” for the Web. It is also used in creating multimedia applications and can be applied to provide links within or between various computer documents. An example is the “Help” function in many Windows-based computer software packages. (See HTML, Web)

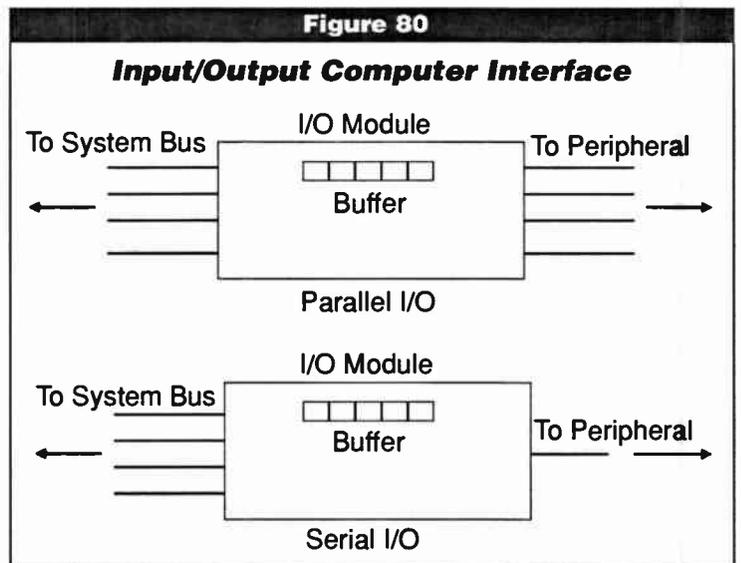
**Hz - Hertz**

(See Hertz)

**I/O - IBOC****I/O - Input/Output**

Generally, any information or signal that comes into a system or is produced within, generated by, or transported out of a system. I/O is also a

task to be performed or a function of various devices or equipment that moves information into or out of a system. Computer I/O devices include disk drives, modems, or printers which either provide data information or signals to the CPU for processing or to which the CPU sends information for storage or transmission purposes.



Source: NAB

**IA - Intelligent Agent**

Computer software programs designed to perform autonomously and with a high degree of built-in flexibility. The degree of "intelligence" varies with the complexity or sophistication of the software. Agents typically are designed as tasking programs, and the sophistication of the software determines the extent or types of tasks the particular agent is able to perform. IAs may be created to perform specific functions or actions such as locating products according to specified criteria, or even make certain types of decisions without human involvement. Agents may operate proactively, to initiate a specific communication or transaction, or reactively to respond to external events and conditions. Certain agents are able to "learn" from user behaviors, and update their own knowledge base to accommodate this behavior style. (See AI - Artificial Intelligence)

**iBlast**

A new player in the digital datacasting business backed by 12 major broadcast station group owners launched in March 2000. Investors and founding partners in the Los Angeles-based company include Tribune Co., Gannett, Cox, Post-Newsweek, E.W. Scripps, Meredith, Media General, Lee Enterprises, The New York Times Company, McGraw-Hill, Smith Broadcasting and Northwest. The partners are inviting other broadcasters to join and in exchange each would receive an equity stake in the digital datacasting company commensurate with its coverage, an ongoing percentage of the revenues, and the ability to use iBlast's data-insertion system to broadcast their own local multimedia content. The new intra-industry datacasting partners view iBlast as a way to improve the competitive footing of their network-affiliated stations. It is possible that at some point a DTV datacasting revenue stream will replace the traditional financial compensation paid to affiliate stations for the carriage of the network's signal. It was made clear that network O&O's (owned and operated stations) are welcome to join the datacasting business consortium. (See Datacasting)

**IBOC - In-Band On-Channel**

Refers to a developing digital audio broadcasting (DAB) system where digital radio signals are transmitted over the same frequency band as analog AM or FM radio, but employing a separate modulated digital signal. IBOC systems have been laboratory tested under a joint EIA/NAB

committee and are undergoing field testing prior to a recommendation on technical standards being submitted to the FCC as part of its digital audio radio service proceeding. (See DAB, SDARS)

**IC – Integrated Circuit**

An integrated electronic circuit often called a chip, combining multiple functions on a single silicon wafer. (See Chip, Chip Set, VLSI)

**ICMP – Internet Control Message Protocol**

A function of Internet transmission protocol, which transmits digital error detection, messages back to a message source to notify it of any errors in transmission or processing. Operationally, a host or network gateway server receiving an Internet message will return a message back to the transmitting host server if an error is detected. However, ICMP cannot perform error checks on its own messages.

**ICO**

ICO Global Communications is one of the LEO and MEO mobile satellite systems proposed for a range of mobile and broadband signal delivery over the next decade. ICO's first spacecraft was unsuccessfully launched from the new ocean-based launch platform, Sea Launch, in mid-March 2000. (See LEO, MEO, Sea Launch)

**Icon**

In the computer environment, this refers to a small picture used to represent a particular function, utility, software application, or command, etc., which are commonly used in graphical user interface (GUI) software such as Windows. Using a pointing device such as a mouse, a user can point and click on the icon to initiate whatever function the icon represents.

**ICQ™**

Abbreviation for "I seek you," it refers to a proprietary chat system originally developed by Mirabilis Corp., and later purchased by American Online. Available to anyone connected to the Internet, it is considered to be one of the most valuable Internet properties today as it had more than 40 million registered users at the end of 1999. (See Computer-Mediated Communication, IRC)

**iCraveTV**

A Canadian website that touched off a firestorm of protest from local U.S. television stations for offering streaming video of television stations signals without notifying, asking or gaining permission of the stations for "use" of this copyrighted material. The website has since halted the practice under court order. At Congressional hearings held by the House Telecommunications Subcommittee in mid-February 2000, chairman Billy Tauzin (R-LA) stated streaming video's threat to broadcasters [is] the "first little puff of wind blowing in a storm...If iCraveTV, or its ilk, is successful it would mean [a local TV station's] "Grade B" contour becomes 6 billion people on the Web." To combat the growing threat of copyright infringement resulting from the Internet, a broad coalition of parties formed a "Copyright Assembly" to deal with rising Webcasting copyright issues. The group includes broadcasters, cable operators, movie associations, software companies, music companies and sports leagues. Due to the Internet and loosening laws concerning the transmission and reception of Internet signals in other countries such as Canada, analysts and experts are saying that sites like iCraveTV will become more prevalent in the coming years. Analysts and industry players are struggling to determine how Internet sites that stream broadcast signals will impact the concept of copyright ownership, as well as the value of cable franchises and local broadcast signals. (See Digital Copyright, Webcaster)

**ID - Incremental Backup****ID**

Refers to a unique personal identification code comprised of a set of alpha/numeric characters (often 6 – 10 characters) that is used in conjunction with a unique password in order to gain access as a subscriber to a secure portion of an Internet website. (See Authentication, Password, SSL)

**Image Map**

In Internet HTML processing, a graphical image containing so-called “hot spots” based on image mapping coding. When a user clicks on a hot spot the browser loads a corresponding document linked by image mapping software. (See Hot Spot)

**Image Processing**

The process of digitizing and manipulating video images which has been created via digital scanning or captured on tape or disc by digital cameras. Image processing also entails converting or processing visual or graphical images, pictures, motion, text, etc., into digital “machine-readable” formats such as when a picture is scanned into a computer. The scanner converts the picture or image by breaking it down into small pieces represented in digital binary format for storage and later retrieval purposes.

**IMAP – Internet Message Access Protocol**

Refers to a protocol, or set of rules, that allows users on a client computer to gain access to and manipulate email that resides on a server. Users can synchronize their client and their server email boxes as they read email, create and remove folders and messages, search for messages, and much more. (See Client/Server, Email)

**Impedance (Z)**

A measure of the total amount of opposition encountered in an electrical circuit against the flow of alternating current (AC). Impedance is measured in ohms and expressed as (Z) in mathematical formulas. The impedance measure in AC systems is different from DC circuit resistance (also in ohms) due to the inclusion of AC energy storage parameters resulting in a vector summed quantity, somewhat like the hypotenuse of a triangle. Maximum power transfer occurs when impedances are matched between two devices. Mismatches in impedance cause part of the signal to be reflected causing distortions in the signals.

**In-Band Signaling**

A type of signaling used in telecommunications networks in which a separate path is established within the voice channel or band itself for call setup and tear down. In-band signaling is transmitted within the telephone line for the voice communication signal to detect when a communications pathway is in use and when the connection needs to be terminated (i.e., when someone hangs up the phone). Digital systems using ISDN, transmit in-band signaling functions in a “virtual” separate channel (D-Channel) where 8 kbps of information are dedicated to maintenance of the calling system. (See ISDN)

**Inclined Orbit**

A type of satellite orbit used for various applications for remote sensing, new proposed mobile satellite services, and others. (See Elliptical Orbit)

**Incremental Backup**

Refers to the process of making copies of only the files that have been altered since the last backup procedure rather than making copies of all files in a computer system. (See Archive, Data Vaulting, Data Warehousing)

**NAB**

**Indeo Video**

Chipmaker Intel's proprietary format for a software package and/or add-in circuit board which are used in converting analog video signals into a digital format. The process allows users to encode and compress NTSC television or other NTSC-formatted video to a compressed digital computer file. These compressed video files can be edited or transported via telephone modem. The format of the Indeo Video digital file is very similar to the Motion JPEG file format. (See MJPEG)

**Information Appliance**

A consumer device that performs only a few targeted tasks and is controlled by a simple touch-screen interface or push buttons on the device's enclosure. An information appliance is usually designed to perform a specific activity, such as music, photography, Web surfing, email, or writing. A distinguishing feature of information appliances is the ability to share information among themselves. Many analysts predict that within the first half of this decade, information appliances (especially those designed to connect users to the Internet) will supplant personal computers as the preferred means of carrying on day-to-day activities online. (See Intelligent Homes)

**Information Metering**

Also known as "pay-per-use," this system provides an audit trail for any electronic documents so that copyrights can be honored and owners can be compensated each time the document is used. Information metering is now widely used in many digital library solutions. (See Encrypted "Containers")

**Information Provider (IP)**

Refers commercial companies, businesses or other entities that offer any type of content information such as data, text, audio, video, film, print, photography, graphical imagery, etc. for public consumption or private use. Also referred to as content providers, IPs include broadcasters, cable MSOs, newspapers, magazines, video and film producers, telephone companies, on-line services and electronic publishers, among others. IPs typically own the copyright to their content/information and make it available in various forms to others on a commercial basis, or under various types of business agreements. IPs are differentiated from information service providers in that service providers offer capabilities for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications networks or systems.

**Information Superhighway**

A relatively dated term referring to the development and converging business environment of digital communications, electronic media, computers, satellites and related electronic hardware, network infrastructure, and emerging intelligent software systems. The "networked" communications systems environment will provide information and automated operational services to businesses, schools, "smart homes, public and private health, research, financial, university and government institutions and agencies, among others. The Internet's network of networks is an initial foundation for the electronic information infrastructure of the future. (See Internet Appliances, Smart Home)

**Infrared**

Part of the spectrum located between electromagnetic radio frequency signals and visible light spectrum. Infrared signals are commonly used in television remote control devices, some short-distance line-of-sight communication links (for example, between two buildings), and certain

**Infrastructure - Install/Uninstaller**

fiber optic systems. Standards for infrared applications are being developed by the Infrared Data Association (IrDA).

**Infrastructure**

In communications, infrastructure refers to the installed-base and future construction of a broad range of wired and wireless systems, operations, networks, physical plant facilities, equipment and operating system software, enabling connectivity, any time, anyplace, anywhere to create the super information highway/NII goals in the 21st Century. U.S. estimates widely vary, but expenditures of about \$250 billion are forecasted for information infrastructure costs. The telecommunications industry holds \$60 billion in debt, and analysts predict that as much as \$30 billion in equity money is available from venture capitalists for infrastructure upgrading. Remaining capital costs for U.S. infrastructure upgrading is to come from business revenue growth and cost savings. On a per home basis, broadband FTTH or FTTC infrastructures to serve U.S. homes is estimated at \$1,200 - \$1,700. System costs include home set-top boxes, and media or video server systems. Total projected cost estimates for futuristic video services are over \$2,000 per household, exclusive of any programming content costs (i.e., purchase, production, acquisition, or licensing cost for programming).

**Initial Public Offering (IPO)**

The process of bringing private companies to the public market for the first time. IPOs occurs when a company registers its stock with the Securities and Exchange Commission and can sell equity ownership in the company to the public. Access is gained to a source of capital that did not previously exist. There are numerous reporting and compliance issues to deal with from the IPO that often involves a considerable expense.

**INMARSAT - International Maritime Satellite Organization**

An international organization set up under treaty agreement to provide international mobile communications originally for ships at sea, and later for aircraft in flight, and mobile vehicles. The functions of the organization have met with growing competition. The organization, similar to INTELSAT, is undergoing privatization under the direction of its international board of governors at the behest of the member governments that support the organization.

**Input**

In computer or communications systems, refers to any incoming signal. By extension, input also refers to the line or cable that transports the signal to a connection point or "port" on the system for receiving the incoming signal from a peripheral device, other equipment or signal source such as telephone modem.

**Insert Editing**

The process of editing video or audio tapes by inserting additional material on an existing tape without interrupting the synchronization or timing on the control track. (See Black Burst)

**Install/Uninstaller**

Computer software it must be "installed" onto a desktop or laptop computer before it can be opened and used. The software installation process involves copying files from CD-ROM discs provided by software vendors onto a user's computer system, along with special setup instructions. If a user ever decides to remove installed software from a computer, a specific "uninstall" program is required to be run to delete these files. Uninstall programs thoroughly search a computer's hard disk for all files copied or created during the installation process, and from the

subsequent use of the particular program. Once installed files are detected, the uninstall program completes the process by deleting all earmarked software files.

**Instant Messaging (IM)**

A type of Internet message or text communication between two or more users that enables them to hold conversations via messages that are received and immediately enable others to respond. Such IM'ing sessions are becoming a replacement or substitution for long-distance and even local phone calling, and has great appeal to teen age demographic groups typically restricted in the amount of time that can spent on long-distance calls. IM'ing enables lengthy cost-free "conversations" via the Net among friends, business or academic colleagues, or others located beyond one local telephone calling area.

**Integrated Voice Data**

A type of telecommunications network or system in which voice and data information are combined, or integrated for transmission on the same transmission medium.

**Intellectual Property**

Refers to any intangible property created by human intelligence such as the expression of thoughts or ideas in a fixed medium of expression, distinctive words, phrases, logos, and other symbols use to identify goods or services, inventions and processes, and novel and generally unknown ideas, processes and technical designs that provide commercial advantage in the marketplace. Intellectual property is that which is generally protected under copyright, patent, trademark, or trade secret laws.

**Intelligent Homes**

Homes designed and constructed with new digital networking technology and "intelligent" appliances. The home electronic infrastructure and appliance network will be based on technical standards enabling users to provide instructions remotely over wired or wireless phones or the Internet, and enable the networked appliances to "talk" with each other based on new command inputs, or pre-programmed instructions. Chip-enhanced intelligent systems will be able to control routine functions such as monitoring heating and air-conditioning systems, turning individual appliances and lights on or off at pre-programmed times, setting security system alarms, controlling stereo music in individual rooms, or even opening/closing blinds. Voice activation synthesizers are expected to provide easy programming and control of these integrated home systems. (See Information Appliances, Smart Home)

**INTELSAT LLC**

Intelsat LLC is the recently created entity for privatization of the global Intelsat consortium. The company filed with the Federal Communications Commission a consolidated application for authority to operate C-Band and Ku-Band satellite systems seeking U.S. licenses for 17 in-orbit satellites, 10 replacement satellites and 13 orbital redeployments. Intelsat plans to privatize under the new company by April 2001. Intelsat is a global inter-governmental entity established by international treaty agreement and its fleet of satellites is not directly licensed by any country. In connection with Intelsat's privatization, orbital positions and frequencies now registered for international use will be licensed to Intelsat LLC, the private successor company.

**Interactive**

Typically refers to communications services, applications, or products offering two-way rather than traditional one-way channels or links. Interactive video, audio products or services are able

**Interactive Television - Interference**

to offer a greater range of options or choices to meet consumer/user demands. Examples include electronic shopping, education/entertainment via CD-ROMs, Internet access, distance learning networks, proposed video-on-demand movies, PPV sporting events, emerging datacasting information services, cable video game networks, etc. The deployment of telephone company hybrid fiber/coax networks and upgraded cable systems will prompt further development of a range of interactive services.

**Interactive Television (ITV)**

Growth of the Web and digital streaming technology is supporting renewed consumer and business interest in interactive media including interactive television programming. Additional impetus for ITV development was adoption of new standard for interactive video material within the broadcast television environment. The specification standard adopted in February 1999 by the Advanced Television Enhancement Forum (ATVEF) defines the technical format for interactive television programs when enhanced with data, or additional viewing material such as Net/Web content. Convergence of broadcasting, media content providers, and Web-based content is underway. Third-party content aggregators, distributors, and syndicators also are moving to meet rising consumer demand for interactive IP multicast services. (See VBI, and VOD)

**Interactive Video**

1. The term is often used interchangeably with interactive television and, in this regard, refers to a broad range of interactivity options related to video services such as PPV, near video-on-demand, play-along game shows, etc.
2. Interactive video also refers to new types of video programming created or produced to allow users to interactively select or determine the direction of a program, its characters, action, plot development, or other movie or story elements. Interactive video products include various video games such as "Myst," which combines computer video functions with interactive user input.

**Interconnect**

Essentially, to join or connect together two or more pathways, systems or communication mediums usually at a particular switching point or signal hub facility. The term can be applied to many situations or conditions but usually refers to points of connectivity between networks or systems.

**Interexchange Carrier (IXC)**

Telephone industry lexicon referring to all long-distance carriers such as AT&T, MCI, and Sprint. Prior to the passage of major legislative reform in early 1996, all local telephone companies (called Local Exchange Carriers (LEC)) had to transmit any long-distance calls originating in their areas to an IXC in order to complete a call that crosses Local Access and Transport Area boundaries (LATA). With the new Telecommunications Act of 1996, this statement will eventually no longer be true. IXCs now have the right to provide local services, and LECs will be granted permission by the FCC to provide long-distance services. (See LATA, Telecommunications Act of 1996)

**Interface**

A point of connection (virtual or physical) between two pieces of equipment, software systems, or between a user and a computer or electronic system. (See GUI)

**Interference**

In RF communications, refers to any unwanted energy that is received along with a transmitted

signal that disrupts, causes degradation, or otherwise decreases the quality of the signal. Often casually referred to as noise, interference can decrease quality to the point of total loss of the original transmitted signal. Interference comes from many sources, including electronic devices or even fluorescent lights, that create stray signals that interfere with broadcasting or other communication signals.

### Interlace Scanning

In current NTSC television broadcasting, interlace scanning is a technique in which alternating video lines (beginning with the odd numbered lines) are traced by an electron gun onto the television set tube to create television pictures. It is called interlace because there are two sets of lines, called fields, that need to be traced for every frame of video, and when the two sets of scan lines are combined together by the viewer this creates a complete video frame. A standard NTSC television signal is comprised of 525 scan lines (the frame). Interlaced scanning requires tracing every other scan line moving from left to right, and from top to bottom and then the system resets itself to the top of the screen again. The entire process is repeated 30 times a

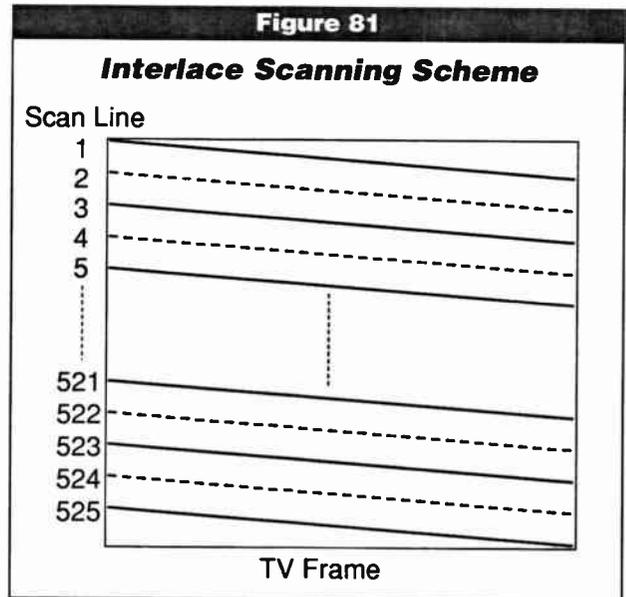
second (30 Hz rate), however, since a picture with half the lines of a frame (a field) occurs at twice that rate, television signals are said to be displayed at a 60 Hz rate or 60 fields per second. Other line rates for interlaced scanning are used in certain computer displays, but more commonly the computer industry has embraced and promotes non-interlace technology, also called progressive scanning. Both interlace and progressive scanning methods can be handled by most advanced digital television or HDTV systems. With digital systems, the scanning format for the display does not need to be the same as the video capture system. Scanning is distinctly different from 35mm film display which has no defined line locations, but instead is actually a series of still photographs run in sequence and displayed at a frame rate typically of 24 frames per second. (See Progressive Scanning)

### Inter-LATA

Telephone industry lexicon for transmissions that cross from one particular geographic area (referred to as a LATA) into any other designated LATA. As part of the divestiture of AT&T in 1984, the country was divided into 161 LATAs. Local telephone companies (i.e., Local Exchange Carriers) were not permitted to deliver Inter-LATA services but had to deliver their calls or other services to a separate interexchange carrier (IXC) for final delivery to the intended party. (See IXC, LATA)

### Interleaving

A multiplexing technique where two or more signals are sent over a medium in an alternating pattern. In data transmission, Time Division Multiplexing (TDM) is used to achieve interleaving. In broadcast television, a form of interleaving is used where the color subcarrier is suppressed within the video signal where it alternates with the luminance information. In essence, the



Source: NAB

## Internet - Internet Address

subcarrier fits within the signal; therefore, no further bandwidth is required outside of the 6 MHz allotment to carry color information. The YUV, Y meaning luminance and UV meaning chrominance, information is once again separated when the signal is stripped from the modulated signal into its baseband form at the receiving end. The process of interleaving can also refer to interlace scanning where odd and even fields are combined to create a frame of video information. (See Interlace Scanning, TDM)

### Internet

A vast collection of interconnected networks that all use the TCP/IP protocol, allowing many different networks to work together. The Internet is not owned, controlled or supervised by a single or central authority. It evolved from the government and university-funded ARPANET of the late 1960s and early 1970s to become the most expansive "network of networks" by the end of the 1990s. The Internet connects literally hundreds of thousands of independent networks into a seemingly seamless vast global network, providing links to any computer connected via a standardized IP address.

### Internet 2

The Internet 2 is a revolutionary new upgraded Internet being designed by the academic world for use by the university and research community. When completed Internet 2 will be 100 to 1,000 times faster than the current Internet. This project continues the collaboration between universities, industry, and the federal government that was so effective in developing the current Internet. Over 130 universities have joined forces as the University Corporation for Advanced Internet Development (UCAID) to develop advanced applications for the high-speed, broadband Internet 2 network. (See Next-Generation Internet)

### Internet Address

A unique set of characters/numbers assigned to a sender and receiver of transmitted digital data or communication information. Internet TCP/IP addresses are standardized in the following format:  
aaa.bbb.ccc.d.

**Table 26**

### Internet Growth

*# of U.S. Households on the Internet (in millions)*

1997	25.0
1998	33.3
1999E	38.8
2000E	44.4
2001E	51.3
2002E	56.0

*Source: Forrester Research, Barron's Online, 1/7/00*

**Table 27**

### Internet Address Classes

Three Classes of Internet Addresses	Standard Internet Address*	aaa.bbb.ccc.d
Class A	First three units are assigned	aaa.
Class B	First six units are assigned	aaa.bbb
Class C	First nine units are assigned	aaa.bbb.ccc

*\* In all cases, units not pre-assigned by the Internet Committee are allocated by the organization to which the address is assigned.*

Table 28

**Top Ten Internet Advertising Domains**

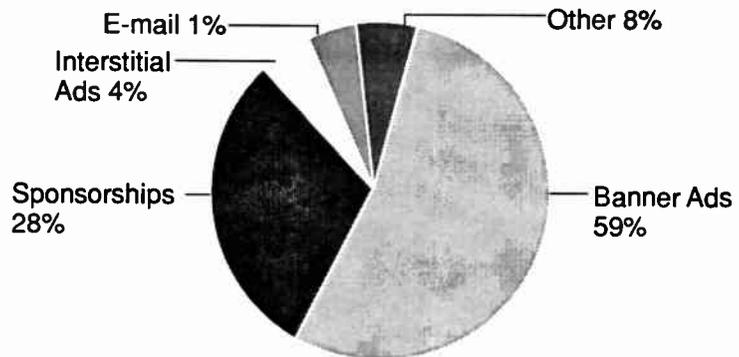
Rank 3Q 1999	Domain Name	Reach %	Rank 4Q 1999	Domain Name	Reach %
1	yahoo.com	38.7	1	yahoo.com	42.4
2	aol.com	27.4	2	aol.com	36.3
3	msn.com	22.2	3	msn.com	28.7
4	netscape.com	18.7	4	netscape.com	16.8
5	go.com	15.4	5	lycos.com	16.6
6	geocities.com	13.6	6	go.com	16.5
7	lycos.com	11.1	7	Bluemountain.com	13.4
8	ebay.com	10.3	8	geocities.com	11.8
9	excite.com	8.9	9	ebay.com	11.3
10	looksmart.com	7.2	10	excite.com	10.3

Source: Nielsen/NetRatings, January 2000

**Internet Advertising**

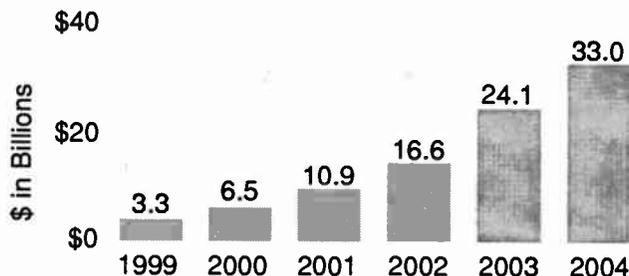
Internet advertising made steady increases in 1999. The number of ad impressions delivered by the top advertising domains grew significantly in the last quarter of 1999, jumping up 63% alone from November to December 1999. Yahoo!, the largest advertising domain on the Web, delivered ad impressions to more than 42% of the active Internet users measured in December 1999, compared its 39% reach in September 1999, according to Nielsen//NetRatings. (See Banner Ad)

Figure 82

**Online Ad Spending Breakdown**

Source: IAB, Q2 1999

Figure 83

**Worldwide Online Advertising Forecast**Source: Forrester Research, August 1999; contact [www.forrester.com](http://www.forrester.com)

**Internet Appliances - Internet Service Provider**

**Internet Appliances**

Any non-PC device that leverages the capabilities of the Internet to extend Net-based content, services, and applications to all types of end-users. According to Hambrecht & Quist, sales of Internet appliances will outpace the growth of PC sales, with the crossover point expected in 2001. The Internet appliance market particularly wireless receivers for Web access are skyrocketing in global markets such as Japan and Asia where the build-out of the wireline telephone infrastructure is not as dense as in North America. Wireless IP access caters to consumer demands for increased mobility, content and access options, and fast connectivity. Combined with IP multicasting consumers are promised fast access to the Internet or other emerging private networks from any wired or wireless electronic device. Internet appliances are poised to revolutionize the way information is used and accessed by average consumers. (See IP Multicasting.)

**Internet Keyed Payment (IKP)**

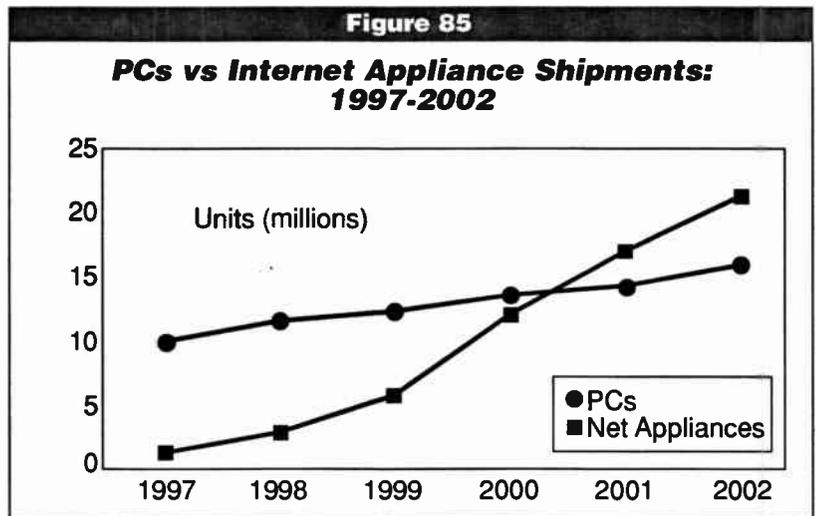
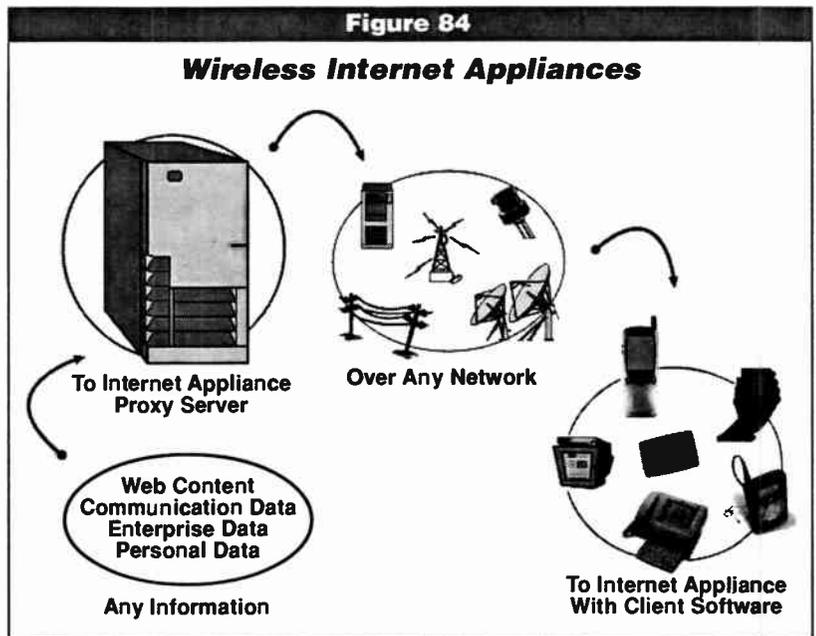
A group of secure payment protocols created by IBM that let customers purchase goods and services securely over the Web.

**Internet Protocol**

(See IP)

**Internet Service Provider**

(See ISP)



### Internet User Market

The number of Internet users spending time online every day rose from about 19 million users in 1996 to 40 million users in 1999. More than 30 million U.S. adults use on-line services, and the number is expected to double to 60 million in 2000 - 2001, according to a survey by FIND/SVP. Another 10 million current online users are under 18 years old; 6 million go online at home and another 4 million log on to the Net from school.

Internet users roughly parallel overall U.S. demographics, with 86% being Caucasian whites which closely tracks (85%) the general population. Non-whites account for 14% of Internet users, but within this group Asians tend to use the Internet at higher rates than others. African Americans represent 9% of Net users and make up 10% of the general population. The average age of Net/Web users is thirty-four, with 40+% being female - a significant change in Net user trends in the last few years. Contact: <http://www.findsvp.com/>.

Table 29

#### Top 15 Countries - Internet Users\*

Rank	Country	Internet Users (000s)
1	U.S.	110,825
2	Japan	18,156
3	U.K.	13,975
4	Canada	13,277
5	Germany	12,285
6	Australia	6,837
7	Brazil	6,790
8	China	6,308
9	France	5,696
10	South Korea	5,688
11	Taiwan	4,790
12	Italy	4,745
13	Sweden	3,950
14	Netherlands	2,933
15	Spain	2,905

\* Year end 1999

Source: Computer Industry Almanac

Table 30

#### Internet Home Usage (U.S., February 2000)

Internet Universe (U.S.)*	
Current internet universe estimate	122,951,350
Active internet universe	76,547,893
Average activity for an internet user	
Time spent per month	9:19:20
Number of sessions per month	18
Number of unique sites visited	10
Time spent per site	54:41:00
Time spent during surfing session	30:56:00
Duration of a page viewed	0:53

\* Estimates are based on a sample of households that have internet access and use Windows 95/98/NT, and MacOS 8 or higher. Internet universe is defined as all members (ages 2+) of a U.S. household which currently have access to the internet.

Source: Nielsen/NetRatings, ©2000 NetRatings, Inc. Contact: [www.nielsen-netratings.com](http://www.nielsen-netratings.com)

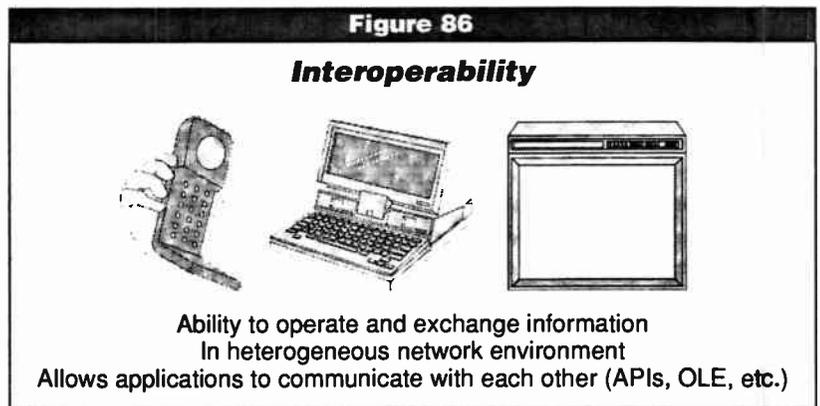
### InterNIC (Internet Network Information Center)

The primary agency charged with registering and maintaining the database of Internet domain names (.com, .net, .org, etc.), InterNIC was originally funded by the National Science Foundation but now operates as a for-profit enterprise. (See Domain Name, Dot.com)

## Interoperability - IP Address

### Interoperability

The ability of communication networks, systems, or equipment to work in concert with other systems, equipment, or networks for the seamless exchange or transfer of data or signals. Interoperability enables different systems to perform or function based on use of open system architectures or other protocols that enhance, rather than limit, rapid exchanges of information among the systems. Interoperability goes far beyond merely establishing an electronic connection, as it also means different software applications from different vendors can work together. Because digital signal processing can support platforms which feature connectivity and interoperability, businesses have the creative opportunity to conceive of new services that combine previously distinct capabilities of television, telephone and computers and other digital devices which could be enormously significant.



*Source: NAB*

### Intra-LATA

Telephone industry description for communication links that take place totally within the boundaries of a designated area called a LATA. (See LATA)

### Intranet

One of the fastest growing segments of the computer network business. Intranets are local networks that use the TCP/IP protocol rather than expensive, difficult to manage, proprietary legacy systems for a range of enterprise-wide communications, distribution of information and management functions. Often intranets allow access only by employees, organization members, or others with special authorization. An intranet site, appears like a traditional website, however, access from outside the organization is controlled by security firewalls to prevent unauthorized entry. (See Extranet, Firewall, Internet, TCP/IP)

### IP - Internet Protocol

The technical format established for the seamless transfer of digital information across the Internet by splitting that information into pieces and routing it from server to server until it reaches its ultimate destination. The use of IP as a transmission protocol standard is becoming more common as the reaches and uses of the Internet continually expand to include activities such as telephony. (See IP Address, IP Multicast, IP Telephony, Protocols, TCP/IP)

### IP Address - Internet Protocol Address

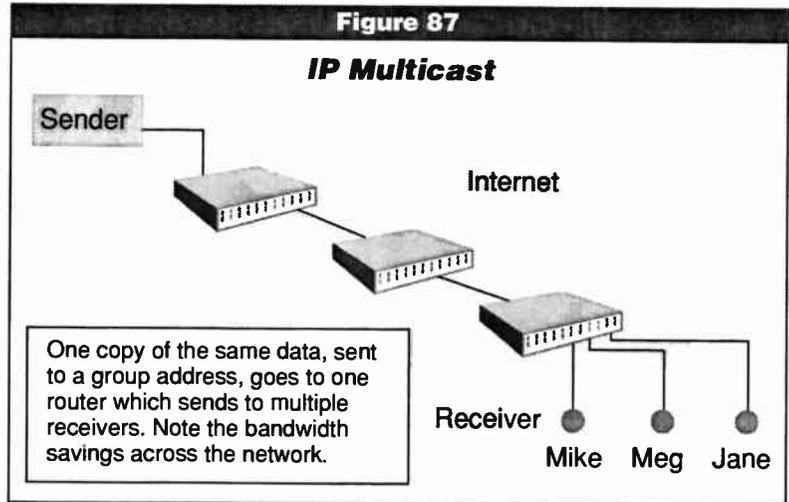
Internet users are assigned a unique address for each individual computer whether connected to a LAN or a stand-alone PC at home. The address is actually a number separated into four parts sometimes called a "dotted quad" which defines exactly where a certain computer is located. An example is: 234.125.124.3, where each section is an 8-bit representation of a number that specifies a certain location. The first number, 234, usually describes the company location. The second number, 125, describes the subnetwork within the company LAN or WAN. The third number, 124, indicates the Local Area Network, and the fourth number, 3 (preceding zeros are never

displayed), indicates the actual host. HTTP addresses are word representations that get translated into IP addresses. Most machines also have one or more "Domain Names" that are easier for people to remember. (See Domain Name, Internet, TCP/IP)

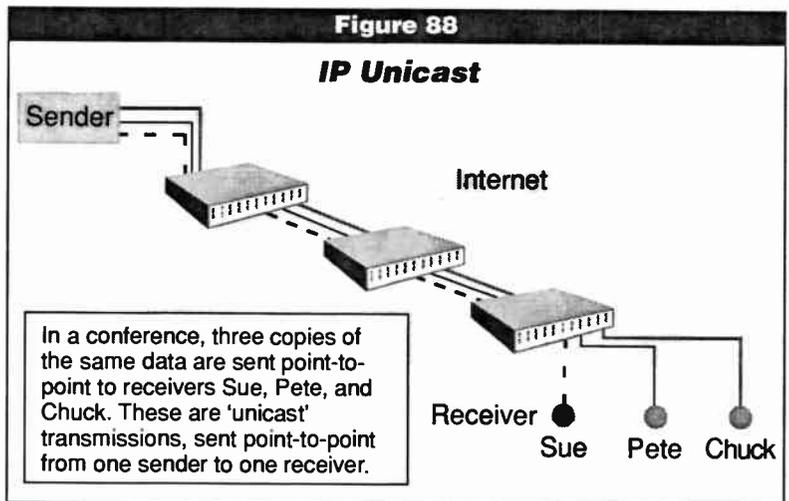
### IP Multicast

IP multicast is a one-to-many transmission enabling a provider to send a single copy of a piece of digital information (e.g., Web page, audio file, video stream, etc.) to many receivers or computers simultaneously over the Internet, or via other IP transmission pathways such as satellite or potentially broadcast DTV. Another method of distributing digital content on the Internet is "Unicast" which sends one piece of data to one user" at a time. Similar to the inherent distribution efficiencies of broadcast or satellite delivery, the IP "multicast" mode offers reductions in the cost of transmission and/or bandwidth. This is because the same data stream is sent to multiple receivers at the same time, rather than as a series of separate signals being sent on a point-to-point basis. Live Webcast programs such as television shows that begin at 7 PM would use IP multicast because many people could tune in simultaneously by connecting to the IP multicast stream. Alternatively, on-demand video services also have many simultaneous users, but they are requesting different programs at different times, thus using an IP unicast service would be the preferred mode of distribution.

IP multicasting services also could be used for transmission of DTV (or DTT - Digital Terrestrial Television as it is referred in Europe.) A controversy exists over the implementation of IP multicast systems, as it requires all routers and switchers over which a signal travels to "speak the same technical language" (i.e. requires compatible standards.) Although IP is an IETF standard (not IP) some Internet service providers (ISPs) are not inclined to adopt IP multicasting technology as it reduces profits from selling bandwidth for individual IP unicast sessions. However, video or other content providers would save costs using IP multicast if the delivery networks are enabled to manage these services. Source: Peggy Miles, president, Intervox.com, author with



Source: IP Multicast Initiative



Source: IP Multicast Initiative

## IP Telephony - ISDN

Dean Sakai of the second edition of "Internet Age Broadcaster" 8 2000 NAB. Contact: pmiles@intervox.com/. (See IP, Datacasting)

### IP Telephony

The use of IP data connections to exchange voice and fax data that have traditionally been carried over the public switched telephone network. During the late 1990s, an increasing number of telephone calls have been routed over the Internet. Calls made in this way avoid traditional charges and regulations. Companies providing these services are known as Internet Telephony Service Providers (ITSPs). They include telephone companies, cable TV companies and Internet Service Providers (ISPs). There are still many problems with voice quality, latency, compression algorithms, and quality of service. (See IP, IP Multicast)

### IRC - Internet Relay Chat

An Internet program that enables massive multi-user live exchanges or "chat" sessions. There are a number of major IRC servers which are linked together to form these huge chat facilities. Multiple users are able to participate in chat conversations each using a particular "channel." Anyone can create a channel and there are no limits on the number of people or the number of channels that can simultaneously participate in one of these sessions. Private channels can be created for multi-person "conference calls." (See Chat)

### IRD - Integrated Receiver/Decoder

An electronic device used by cable or other video services such as DBS to receive and decode video signals. Usually part of the set-top box used for receiving premium channels and pay-per-view services, IRDs receive the scrambled or encrypted cable or satellite signals decode or unscramble them and, in the case of DBS, convert it to analog for customer viewing.

### IRQs - Interrupt Requests

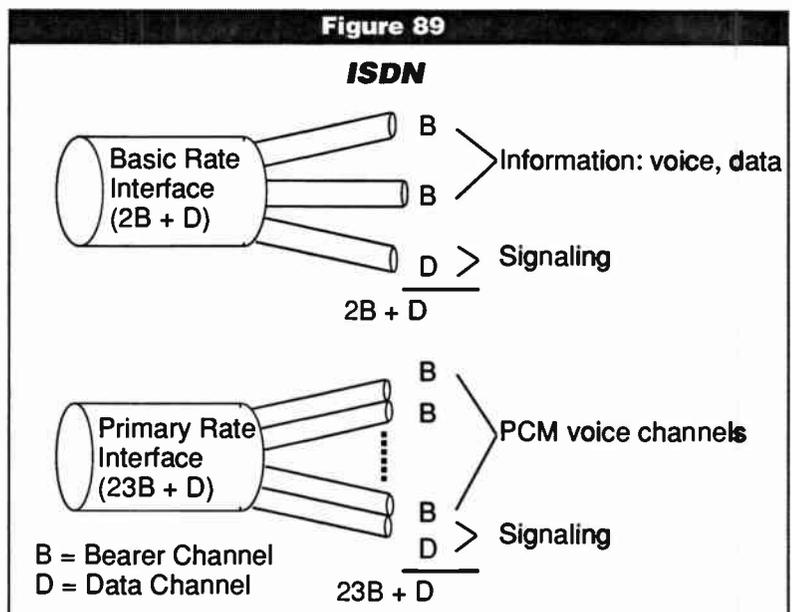
A computer reference to a certain type of signal that is generated by a device connected to the CPU or data bus. The signal is sent to alert the CPU of a request for attention to that device. Examples might be "ready to send," "clear to send," or "ready to receive." Of course, all IRQs (as is true with all computer communications) are sent in binary form (See Binary and CPU).

### ISA - Industry Standard Architecture

The "classic" architecture for an IBM motherboard, usually 16-bit system. (See Bus)

### ISDN - Integrated Services Digital Network

A type of advanced service protocol being offered by local phone companies, which uses standard copper twisted-pair lines for



Source: Bellcore

transmitting high-speed voice, video, data, and videoconferencing signals. ISDN is an all-digital service requiring installation of digital ISDN equipment both at sending and receiving points. ISDN services are divided into two types: Basic Rate Interface (BRI) and Primary Rate Interface (PRI). Both services provide many times the bandwidth available with conventional telephone services. ISDN lines for home computer connections are able to transmit/receive signals at much higher speeds making it easier, thus more feasible, to telecommute, and make Internet/Web connections. (See RI, PRI)

### **iSKY**

A new broadband satellite venture backed John Malone's Liberty Media, Inc. and other investors. In January 2000, the company announced plans to launch at least two new Ka-Band satellites in 2001 and 2002 to provide broadband offerings to consumers.

### **ISM - Industrial, Scientific and Medical**

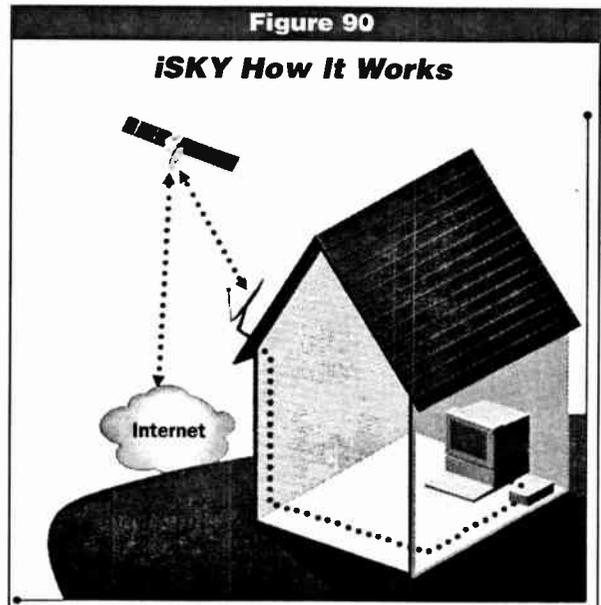
Specific portion of the spectrum ranging from 902 - 928 MHz that has been allocated by the FCC for Industrial, Scientific, and Medical purposes. Certain commercial wireless communication services are being developed for transmission in this band. (See Spectrum)

### **ISO 9001**

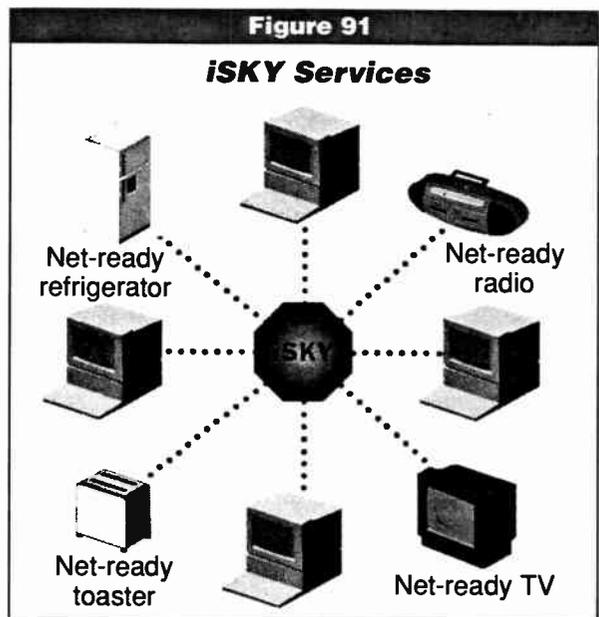
Rigorous international quality standard covering design, development, production, installation, and service procedures. ISO 9001 registration is widely recognized as an indication of the integrity of a business's quality processes.

### **Isosynchronous**

Refers to data transmissions schemes in which data can be transmitted at low or high speeds without changing or affecting the integrity of the data. From the Greek "iso" meaning equal and "synchronous" referring to time or period of time. Essentially, term indicates that a particular type of data can be transmitted without respect to time; it is the opposite of synchronous systems which have very little tolerance for the range of time (real time vs. non-real time) in which they need to be transmitted and received. Voice communications are synchronous as the speed of transmission greatly affects the effectiveness, accuracy, or reception quality for phone users (e.g., satellite time delays in overseas calls.)



Source: iSKY, Inc. Used with permission.



Source: iSKY, Inc. Used with permission.

**ISP - IXC****ISP - Internet Service Provider**

A company that provides individual users or other companies with access to, or a presence on, the Internet. Many ISPs are also Internet Access Providers, which typically includes extra services such as help with design, creation and administration of World Wide Web training, and administration of intranets.

**IT - Information Technology**

A generic term for any technology providing voice, video, graphic, text, data or other services or any processes, techniques, systems or methods for using, manipulating, converting, storing, receiving or managing information or servicing information needs. IT industries include telecommunications, telephony, radio and television broadcasting, cable television, computing hardware and software systems, telecom/computer networking including the Internet and on-line services, information storage/retrieval, satellite communications, among other technological methods for managing information.

**ITFS - Instructional Television Fixed Service**

Refers to a range of microwave frequencies originally allocated for use in instructional television services. ITFS frequencies, when not in use, can be leased along with adjacent channels allocated to Operational Fixed Services (OFS) to provide wireless cable or MMDS services. These services are operating at very high microwave frequencies; thus video services are usually limited to a 25-mile radius. (See MMDS, Wireless Broadband Fixed Access)

**ITS - Intelligent Transportation System**

New name for systems under development in the government's IVHS program. (See IVHS)

**IVDS - Interactive Video Data Service**

A system for two-way wireless communication to and from consumer sites. The Federal Communication Commission (FCC) in 1992 authorized Interactive Video Data Services (IVDS) that could be used in conjunction with television broadcasting to offer interactive television services. The FCC awarded two licenses per market by lottery in nine major markets, and auctioned IVDS licenses in the remaining markets. Limited progress was made in developing interactive services and a portion of the spectrum was opened for re-auction. (See Auction.)

**IVHS - Intelligent Vehicle Highway System**

A U.S. government effort to develop integrated electronic data and "intelligent vehicle" information systems to assist motorists, reduce congestion and gridlock, and increase driver safety and traffic flow. Part of the development of an IVHS system is based on increasing the amount and type of information available to drivers. Systems under consideration include data broadcasting services that would transmit traffic, alternate routing and other information over FM radio subcarriers, or in television vertical blanking intervals.

**IX**

(See Interference)

**IXC**

(See Interexchange Carrier)

**Jack**

In electronics equipment, a jack usually refers to a “female” receptacle that will accept a compatible “male” connector or plug. The most common types of jacks are RJ-11 receptacles, which have been, and continue to be, used in conjunction with telephone cords to provide connectivity between a phone handset or modem and the Public Switched Telephone Network. (See PSTN)

**Java™**

Refers to a platform-independent programming language developed by Sun Microsystems in the mid-1990s. Java is an object-oriented, secure, robust, general-purpose programming language that can be used on different operating systems. The language supports programming for the Internet in the form of “applets” and is used in developing small, specialized computing appliances. The Java approaches directly challenges the idea that software must be “installed” and remain resident on a computer to be viable and useful. (See Applet, Cross Platform, Network Computer)

**JavaScript**

Netscape’s simple cross-platform scripting language that is widely used to orchestrate enhanced interactivity and advanced functionality in Web pages (not to be confused with Java). For example, the popular feature of passing a mouse over a graphic or a button on a website and having it instantly change color is achieved through the use of JavaScript. Microsoft began supporting JavaScript in its Internet Explorer browser in the late 1990s; however, Netscape and Microsoft support JavaScript differently. JavaScript can be used to validate entries on a Web page form, launch new browser windows, among other applications. (See Cross Platform, Open Source)

**Jaz Disks/Jaz Drives**

Iomega Corporation’s disk drives that are able to store one to two gigabytes of data at a relatively fast rate on cartridges. Jaz disks/drives are often used to backup information, and they are fast enough to be used as auxiliary hard drives for some computing operations.

**Jitter**

Any undesired short duration shift in the intended signal due to a lack of synchronization during transmission. Jitter can be evident in the frequency, phase, amplitude, or timing of intended signal and can be caused by imperfections in transmission pathway or connection equipment. Jitter can be a common problem for video transmitted on asynchronous networks like ATM.

**Joint Electronic Payment Initiative (JEPI)**

An Internet payment standard proposed by CommerceNet and the W3 Consortium. The JEPI focuses on data security and the interoperability between payment schemes in order to make electronic payment activities widely accepted by the public.

**JPEG - Joint Photographic Experts Group**

Refers to a compression standard endorsed by JPEG that applies to individual frames of still video or pictures. The JPEG standard removes or subtracts redundant information from a frame of digital video in order to compress the signal for computer file storage or to transfer the image in a less bandwidth-intensive form. The standard has been approved by CCITT and ISO standards organizations. (See GIF, Vector Graphics)

**k - Ku-Band****K****k - Kilo**

Refers to quantities measured in 1,000 units. (See Kilohertz)

**Ka-Band**

A subportion of the electromagnetic spectrum within the designated K-band that ranges from 33 - 36 GHz, and is presently used for microwave and mobile satellite communications. Advanced mobile satellite services designed for Ka-band operations will provide two-way connectivity for a variety of wireless telephony and data communications service. Users around the globe will be able to access these services via relatively small handheld transceivers.

**kbps - Kilobits per Second**

A standard measure for digital data rate transmission. Telecommunication modems operate at transmission rates between 2.4 - 28.8 kbps, and fax machines generally run at 9.6 kbps.

**Kermit**

A communications and file transfer protocol developed at Columbia University and implemented by many universities that allows for files to be transferred over VAX computer systems and IBM mainframe computers. Kermit allows for terminal emulation, file transfer, and operating system/hardware platform conversion. Kermit transfers files in text mode and Kermit software is available for many computers and operating systems including Windows, MS-DOS, UNIX, OS/2 and CICS.

**Keying**

The embedding or laying of one signal onto another signal; examples are Chroma Key and Frequency Shift Keying operations. (See Chroma Key and FSK)

**Kilobyte - kB**

Measure of digital information in bytes (8 bits per byte); there are 1,024 bytes in 1 kB.

**Kilohertz**

A measurement of electromagnetic signal frequency where a radio signal propagated at 1,000 Hertz (Hz) (i.e. 1,000 cycles per second) is equal to 1 kilohertz (1 kHz). (See Hertz)

**Kilowatt - kW**

Measure of electrical energy in watts; there are 1,000 watts in 1 kW.

**Kiosk**

An electronic information system usually available in public locations providing access to a range of information such as a menu of locally available services from restaurant guides to retail store locations, or other information of interest to public users. The term is taken from earlier European outdoor information booths in centralized locations where newspapers, magazines and other information and public literature was available or exchanged. Electronic kiosks are interactive video devices often utilizing touch-screen technology to provide directory or local information accessed via a menu tree. Kiosks offering Internet connections for sending/receiving e-mail, browsing the Web, or checking corporate home pages for press releases are proposed for airports and other major traveler locations. Access costs will be charged in 15-minute increments. (See E-port)

**Knowbot**

(See Bot)

**Ku-Band**

A portion of the electromagnetic spectrum used for traditional satellite communications and for DBS video services. Domestic Ku-band uplinks are from 14.2 - 14.4 GHz and downlinks from 11.7 - 12.2 GHz; DBS satellites operate uplinks at 17.3 - 17.8 GHz and downlinks at 12.2 - 12.7 GHz.

**NAB**

### L-Band

A portion of the electromagnetic spectrum, between 1 GHz and 2 GHz, that is used for satellite and microwave communications. Typical U.S. L-Band systems operate between 1.5 and 1.8 GHz. Internationally, the band officially ranges from 1.125 GHz to 1.4 GHz, and also may refer to services operating from 890 MHz to 940 MHz. Proposals for terrestrial as well as satellite Digital Audio Broadcasting (DAB) services are planned to be implemented at L-Band in various countries including Canada, Mexico and in Europe, among others. (See DAB)

### LAN - Local Area Network

A private enterprise-wide high-speed computer network for linking file servers, computers, printers, modems and other peripheral equipment or devices enabling workstations on the network to share information, software, exchange e-mail, or connect with the Internet or other on-line services. LANs are typically confined within a building or can be extended to a number of centrally located buildings in an office park or university campus. Common LAN architectures include Ethernet and Token Ring systems. (See MAN, WAN)

### Land Mobile Communications

Wireless communications providing two-way terrestrial communications links for taxis, police, and other fleet dispatch, or other wireless services to mobile users. In August 1990, companies petitioned the FCC to increase substantially the channel capacity of existing land mobile systems. (See ESMR, SMR)

### LAN Emulation

A software-based protocol allowing for transparent connectivity from an Ethernet or a Token Ring Local Area Network (LAN) to an ATM backbone trunk line. LAN emulation software enables two LANs connected by a high-speed ATM line to perform as if they were a single unified network. The ATM portion functions to provide faster transmission rates over lengthy distances.

### LASER - Light Amplification by Stimulation of Emission of Radiation

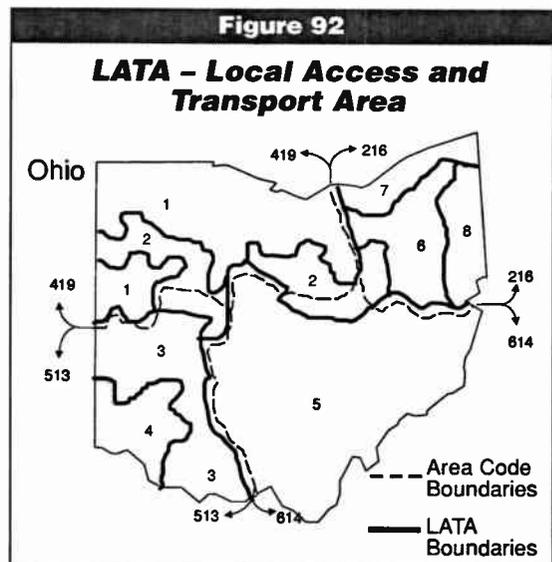
A device used in fiber optics to generate a beam of light that only has one frequency. By turning this light on and off quickly, binary code can be formed by the laser which then can be transmitted over the fiber without much loss, which can provide high rates of data communication. Actual implementations are more complex and do not actually turn the laser on and off, but large amounts of data can be modulated onto lasers for transmission over large distances with little loss.

### Laservision

A laser disc player system in which a laser beam reads encoded digital video, audio or other information stored on a disc without making physical contact with the disc. N.V. Phillips of the Netherlands originally invented the player.

### LATA - Local Access and Transport Area

A telephone industry term for a specific localized geographic area in which a local telephone company operates, and in which it is not



Source: Bellcore

**Layer - Line-of-Sight**

required to use any other carrier to complete phone calls. LATAs should not be confused with regions for area codes or any other jurisdictional boundaries. LATAs (161 total) were implemented following the divestiture of AT&T in 1984. Rules were established at that time describing how calls would be handled between the revamped AT&T and the seven "Baby Bell" RBOCs. Generally, long-distance charges are incurred when a LATA boundary has been crossed in the process of completing a connection. (See Inter-LATA, Intra-LATA, RBOC)

**Layer**

Refers to the defined segments in the digital open system interface model. (See OSI)

**LCD - Liquid Crystal Display**

A type of visual display technology that uses liquid crystals enclosed within two glass panels. LCDs divide the display screen into very small areas or dots that when electrically charged or stimulated it changes the molecular composition of the crystals so that it reflects external light to create a picture image from an input source. Due to their flat display characteristics, LCDs are often used for laptop computer screens. (See Active Matrix Display, Flat Panel)

**Leased Line**

Refers to a type of telephone line used exclusively by an individual or business under a lease arrangement with the phone company. This is not a shared facility commonly found in residential use but a dedicated line. Many businesses have dedicated leased lines for intra-office communication where offices are located in different geographic areas. This can be less costly than paying for continual long-distance toll call charges.

**LEC - Local Exchange Carrier**

Telephone industry lexicon for a local telephone company. LECs can provide Inter-LATA phone services but not Intra-LATA services without the use of an IXC. (See Inter-LATA, Intra-LATA, IXC)

**LED - Light Emitting Diode**

A device that generates light when an electric current or charge is passed through it. LEDs can be used as light generators for use in fiber optic lines although lasers are much more powerful and more commonly used. LEDs often are used as passive indicators of whether power has been activated or turned on in a system.

**LEO - Low Earth Orbit**

Refers to a type of satellite orbit that is relatively low or close to the earth — ranging between 600 and 6,000 miles above the earth. A number of new wireless mobile communication services are being planned or established using LEO satellites.

**LF - Low Frequency**

Portion of the radio frequency spectrum ranging from 30 kHz - 300 kHz and used for long-wave (international) radio services. (See Spectrum)

**Line-of-Sight**

Refers to conditions for RF signal propagation which require a clear path or physically clear line-of-sight between the transmitter and the receiver. Generally, line-of-sight requirements apply to transmissions at higher frequencies, such as microwaves, and for reception of weak signals, such as the reception video satellite signals where dish receivers must have an unobstructed, clear line-of-sight to the satellite.

## Link

A general term used in many communication networks or systems meaning the establishment of a connection; but used most commonly in satellite communications where transmissions are downlinked and uplinked on specified frequencies. (See Downlink, Uplink)

## Link Budget

A communications link budget is calculated to estimate what kinds of losses should be expected in a given signal using a specified communications channel or pathway. Losses are calculated for distance and possible line breakage when telephone wire communication links are being established or set up. Link budgets are also performed for satellite communications as part of the design process in order to design additional gain into a system to overcome nominal link losses.

## Linux™

Developed by enthusiasts and often given away for free, Linux is the fastest growing operating system in the computer world today. Initially developed by Linus Torvalds of Finland, Linux is an "open source" development project. The code that makes Linux work is free and open to the public, which makes it easy for anyone with the knowledge and initiative to fix and/or improve upon the Linux system. There are now several commercial vendors of Linux applications, and there are more and more Linux versions of traditional computer applications (such as WordPerfect) being released for Linux. (See Open Source, Operating System)

## Listservs

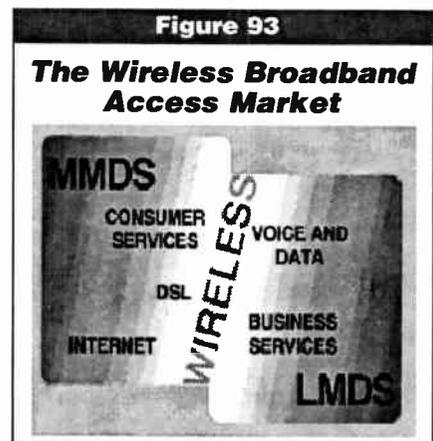
A cyberspace/Internet term referring to a type of program that collects lists of subscribers on a host computer for different Internet bulletin boards or chat groups. A listserv automatically distributes information to all subscribers to a particular forum. Listserv is the most prevalent type of Internet maillist and users can subscribe to a listserv via an automated gateway server. After subscribing, any messages sent through the gateway are forwarded to all subscribers of the mailing list. (See Computer-Mediated Communication, Forum, Majordomo, Mailing List, Newsgroups, Usenet)

## LMDS - Local Multipoint Distribution System

A U.S. regulatory designation for fixed wireless services used to deliver digital broadband video and other services to consumers. LMDS services are relative short-range operations, and employ multiple low-power transmitters distributed throughout a geographic area, rather than a single centralized transmitter as is used in MMDS services. Two gigahertz of spectrum was allocated for LMDS at 27.5 to 29.5 GHz, with 2 licensees awarded 1 GHz apiece in each of 489 designated service areas around the country. (See MMDS, Wireless Broadband Fixed Access, Wireless Communications)

## Load

1. The amount of electrical energy used by an electric appliance, electronic equipment, or the total amount used by a system connected or plugged into an electrical network or power grid.
2. In computer environments, refers to the process of taking information from external sources such as CD-ROMs, Zip discs, floppy disks or a hard drive, and transporting it into active computer memory or RAM. (See pkZip, RAM)



Source: Multimedia Research Group, Inc;  
www.mrgco.com

**Local Loop - Loss****Local Loop**

A telephone industry term for the segment of the phone network that runs from a local central office to a business or residential customer's premise. At a customer premise site, equipment used for communicating over standard voice-grade lines are connected to the switched phone network. Equipment includes phones, PC modems, fax machines, PBXs or other transmit/receiving devices. Plans for upgrading the local loop have been reworked numbers of times, with telcos now favoring DSL as a way to quickly offer broadband connectivity to compete with cable and new wireless Internet options. (See Broadband, DSL)

**Local-into-Local**

Refers to the retransmission of local television broadcast stations back into their own local markets from DBS satellite services. Until 1999, DBS operators were not permitted to deliver local television station signals due to their inherent inability to prevent local signals from one market from spilling over into adjacent markets. In order to enable the DBS industry to compete on an even basis with cable operators - which have gained substantially from the carriage of local TV stations - the local-into-local issue was addressed in passage of the Satellite Home Viewer Improvement Act of 1999. (See Compulsory License, SHVA / SHVIA)

**Login/Logon**

Computer and on-line network jargon for typical entry or access commands to enable a system to identify users requesting access to a computer system. Assigning each user a logon name and password is used as a security measure to control access to the network by preventing unauthorized access. (See Account, Authentication, Challenge-Response, Telnet)

**Logoff/Logout**

Typical computer sign-off commands used to notify the system that a user no longer requires access to system assets. These commands basically tell the network that a user is finished working on the system and can remove the user from any listing of active users.

**Longley-Rice**

A technical engineering methodology used for determining whether individual households in a specific geographic area have access to an over-the-air broadcast television signal or signals. The methodology was developed for assessing signal strength received at a particular geographical location. The Longley-Rice technique factors in objects as buildings and land contours in developing an assessment. The issue of signal strength is of increasing importance in crafting public policies that rely on accurate data for making determinations such as the Grade B signal contours for licensed television stations. This technical signal strength measurement contour is being used as the basis for policy rulemakings affecting matters such as broadcast station must-carry status (for cable and more recently DBS services) and related program copyright compulsory license requirements. (See Compulsory License, Grade B Contour)

**Loopback**

A type of system diagnostic test that is run to check the sending and receiving capabilities of a communication device or system; used regularly in videoconferencing and computer networks.

**LORAN - Long-Range Navigation**

A long-distance navigation system that uses radio waves to determine the location of a person or object. Using LORAN transmitters at different fixed locations, the system can determine a ship or other object's location up to 1,000 miles away.

**Loss**

In RF communications systems, loss is the attenuation of a transmitted signal and it is normally expressed or measured in terms of decibels (dB).

**Lossless Compression**

Types of compression techniques that reduce the amount of information being transmitted but do not lose any of the data. In order for the compression to be lossless, not one bit of information can be lost. (See pkZip/Unzip)

**Lossy Compression**

A type of digital data or signal compression algorithm that eliminates “redundant” information in a signal as a means for reducing the amount of information that needs to be transmitted or stored. While the eliminated information cannot be regained exactly, interpolation techniques are used to restore much of the data for full display in an acceptable form. Lossy compression is often used in video and graphics applications. If any information — even one bit — is lost with a particular compression algorithm, it is considered to be a lossy algorithm useful for many, but not all applications. (See Algorithm, JPEG, Lossless Compression)

**LPFM - Low Power FM**

The FCC has adopted rules that will license very small, low power FM radio stations that would transmit signals to community listeners located within a radius of only a few miles. Eventually, the number of LPFMs could number as many as 1,000. NAB has opposed this plan based on technical studies showing that such proposed low-power stations will create interference to the nation’s existing FM stations.

**LPTV - Low Power Television**

Television stations licensed by the FCC to operate transmitters at low power — ranging from 10-100 watts in the VHF band and at 1,000 watts in the UHF band — and under the rules, do not cause interference to any primary television service. Signal coverage is limited, and LPTV stations primarily are used in less populated areas providing community-oriented and other commercial television services.

**LSI - Large Scale Integration**

Refers to manufacturing technology producing electronic integrated chips containing thousands of transistors on a single IC silicon wafer. (See VLSI)

**Luminance (Y)**

In television broadcasting, luminance expressed as (Y) in mathematical formulas, refers to a measure of brightness for video signals. In color television, the luminance carrier contains all the picture information necessary for a monochrome receiver.

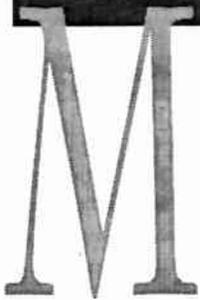
**Lurker**

In the cyberworld, lurker refers to someone who connects to an electronic forum (chat or discussion group) but does not actively participate. This term is not pejorative and is used very casually such as stating, “Oh, I’m just lurking.” (See Chat Room, Computer-Mediated, Forum, Communication, Newsgroup, Usenet)

**Lynx**

Refers to one of the first-ever text-only browser applications that resides on a server and allows users to surf the Web but only see text content. Users navigate from page to page by using commands on their keyboards. Lynx is still being actively developed and maintained, although the vast majority of Internet users take advantage of the point-and-click graphical interface made possible by browsers installed on personal computers. (See Browser)

## M-II - Major Trading Area



### M-II

A professional-quality half-inch videotape format developed by Panasonic to compete with Sony Betacam SP.

### MAC – Multiplex Analog Component

The officially adopted, but not implemented, European standard for high definition television services. (See DVB, HDTV)

### Machine Language

Refers to specific coded language(s) used by computer hardware to perform internal system functions.

### Macro

In computers, a macro is a specific group of program instructions written to automate a sequence of operations or keystrokes for use with a software program. Macros are very short programs designed to produce results more rapidly. In a Windows-like environment, a macro often could be invoked or activated by one keystroke or a single click on an icon that is set-up to represent the macro function.

### Magnetic Storage

Any data storage medium and related technology, including diskettes and tapes, in which patterns of magnetization are used to represent the values of stored digital bits/bytes of information.

### Mailing List

A process of creating a mass mail system on a computer network. A mailing list uses a software program to maintain a list of mailing list “members” to whom messages are to be sent if a message is sent to the list address. For example, the mailing list address [beamem@lima.nab.org](mailto:beamem@lima.nab.org) contains an email list of all consenting BEA members who wish to participate. They can receive email from the list whenever anyone sends a message to the list address, and they can send messages to all other members on the list by sending an email message to the list address. Some mailing lists are “moderated,” which means that messages are initially sent to a single individual who then screens messages and sends approved ones on to the mailing list members. (See E-mail, Listservs, Majordomo)

### Mainframe Computer

A centralized computer architecture typically with substantial memory, access and processing speeds used to manage large numbers of application programs and peripheral equipment. Through mainframes other computers or dumb terminals connected to the network are able to access stored programs or utilize peripheral equipment. Mainframes are called upon to perform complex functions that systems with fewer capabilities to access large numbers of attached devices cannot handle and to process massive business files such as billing records for banks and phone companies. At times, a minor job function for a mainframe is to act as a LAN server. (See High Performance Computing, Supercomputer)

### Majordomo

Similar to an Internet/Web-based Listserv system, Majordomo is the name of a free e-mail list server that automatically distributes specific message to everyone on a particular email list. (See Listservs)

### Major Trading Area (MTA)

Refers to the geographic boundaries that segment the country for telecommunication licensing

purposes. Based on *Rand McNally's Commercial Atlas & Marketing Guide*, each MTA is named after one or more cities that form the regional Major Trading Center. MTAs are generally larger than BTAs. The FCC has used MTAs to license a number of services, including broadband and narrowband Personal Communication Services. (See Basic Trading Area)

### **MAN – Metropolitan Area Network**

A high-speed data network able to geographically cover an area up to 50 km. MANs are smaller than a Wide Area Network (WAN) but larger than a LAN, and typically are described as an intra-city network.

### **Mapping**

1. In computer and telecommunications networking, mapping is the process of connecting the protocols in various parts of a network or connecting protocols from one network to another network.
2. In advance graphics systems, mapping is used to describe a process of putting a surface texture quality onto a three-dimensional object (also called texture mapping).

### **MapServe**

MapServe is a type of software allowing World Wide Web servers, housed on a Macintosh or Power Macintosh computer, to provide point-and-click graphics with so-called “hot spots” which when clicked on with a pointing device engage an active hyperlink to some other Web location. These links can switch the users to other documents available on the Web via Uniform Resource Locator addresses. (See URL)

### **Mark-up Languages**

Refers to the process of “marking up” text with encoded information about what should be done with a particular piece of information. Similar to using a yellow highlighter on a textbook, mark-up languages identify key areas of a document that require special attention. The codes and command sets called “tags” form the syntax of the language.

**Table 31**

### **Mark-up Languages**

<b>Acronym</b>	<b>Description</b>
SGML	A “meta” language used for defining other mark-up languages. SGML allows for the structuring and organization of a document, enforcing a consistency in how the information is handled, and it allows for the information within multiple documents to be cross referenced. Using SGML is similar to putting separate pieces of information into a database that can then be referenced, reordered, and manipulated in a variety of ways.
XML	<i>Extensible Mark-up Language</i> – A simplified version of SGML, XML is used to organize and manipulate types of textual information on the web.
HTML	<i>Hypertext Mark-up Language</i> – The standard for marking up web pages.
DHTML	<i>Dynamic Hypertext Mark-up Language</i> – Used to add advanced formatting instructions and interactive features to web pages.
VRML	<i>Virtual Reality Modeling Language</i> – A 3-D modeling language delivered over the web using a special program, or “player,” to display VRML content.

**Mask - Megabit****Mask**

A transmission filtering technique designed to prevent undesired frequencies from entering or leaking into a specific RF signal reception or transmission path.

**Master**

1. Refers to the original production of any video or audio recording typically on very high-quality tape or laserdisc. In videotape production work, a master tape contains raw footage that is to be edited, processed or finished for use in television broadcast or other video distribution venues.
2. In data transmission systems, a master is the device that determines the rate of transmission and timing for a data transaction.

**Matrix**

In communication systems, a matrix refers to an arrangement of potential connections designed to allow any two points to be connected through a switching system. A simple matrix switch would have just two inputs and two outputs; the inputs would be connected to the outputs via the switch.

**MATV - Master Antenna Television**

A type of main local antenna system usually installed on the roof of an apartment building that is connected to a coaxial cable distribution network serving the residents in the building. MATV systems typically were installed on apartment buildings or other facilities, such as hospitals in urban areas, where residents had difficulty receiving over-the-air signals due to multipath interference. The growth of satellite-delivered cable and DBS services has reduced the need for traditional MATV systems. (See DBS, DTH, SMATV)

**MD - Mini Disc**

Sony developed the Mini Disc format as a competitor to digital compact cassettes (DCC). Although MDs do not quite produce CD-quality sound, they are miniature recordable version of CDs. Similar to DCCs; psycho-acoustic procession is used to store compressed digital audio signals on the erasable discs. The 2.5-inch discs can store 74 minutes of recorded music and are played on a new MD player. The MD system uses advanced digital error correction and interleaving processes to create a system that is far more resistant to bumps and vibration than compact discs. Mini Disc players and recorders were introduced in the fall of 1992.

**MDF - Main Distribution Frame**

Telephone industry lexicon for a series of electronic blocks used to connect outside telephone lines to lines used inside a customer's business. For a telephone company, the MDF is usually the point of demarcation where it relinquishes servicing responsibilities.

**Medium**

Generic reference to systems or methods — electronic or otherwise — that transmit, deliver, distribute, convey, store, or make accessible information of any kind.

**Megabit (Mb)**

A measurement of the rate of digital data transmission over a specified amount of time, usually per second (ps). One (1) Megabit equals 1 million bits of digital information. An example is a system that transmits data at 10 Mbps.

**Megabyte (MB)**

A measurement of digital data storage capacity where 1 MB equals 1 million bytes of digital information. Common examples are 16 MBs of RAM or a 750 MB hard drive.

**Memory**

Internal capacity of a computer or integrated computer system for short- and medium-term retention of digital data in readiness mode for immediate, rapid accessibility by system users. (See also RAM and ROM)

**Meta Tag**

A special background portion of a Web page that provides information about the page and the website of which it is a part. Meta tags can be used to record information about who composed the Web page, what software they used, and how often the page is updated. Perhaps most importantly, meta tags are used to contain descriptions and key word information that is used by search engines when they are cataloging the website's content. One of the most important characteristics of an easy-to-find website is the care that went into formulating and refining the information contained in the meta tags. (See Search Engine, Spider)

**Metadata**

A set of auxiliary time-codes or other summary information related to specific portions of audio, video, data or text material that comprise components of a work of intellectual property. Metadata may represent data set assets, thumbnail images for quick visualizations, or coding to facilitate accurate, rapid retrieval of specific items embedded within the program material. (See Data Warehousing)

**Metcalf's Law**

The utility of a network is equal to the square of the sum of its parts. Robert Metcalfe was inventor of the Ethernet networking protocol and founder of 3Com Corporation.

**MF - Medium Frequency**

Portion of the radio frequency spectrum ranging from 300 kHz to 3 MHz. AM radio broadcasting services operate in this frequency band. (See Spectrum)

**MFJ - Modified Final Judgment**

The formal name of the court ordered consent decree establishing the formal guidelines for the divestiture of AT&T in 1984. The MFJ created seven regional spin-off companies from Ma Bell, commonly known as the "Baby Bells," and declared that AT&T could no longer provide local telephone service to customers. (See RBOC)

**MFP (Multi-Function Peripheral, or Multi-Function Printer)**

Refers to a single device that serves several functions, typically including printing, scanning, faxing and copying. Popular in small offices and home offices, buying one MFP is usually cheaper and less complicated than purchasing all four devices separately; however, users can perform only one task at a time, and if the MFP breaks down all functions are lost at the same time. (See SOHO)

**Microchip**

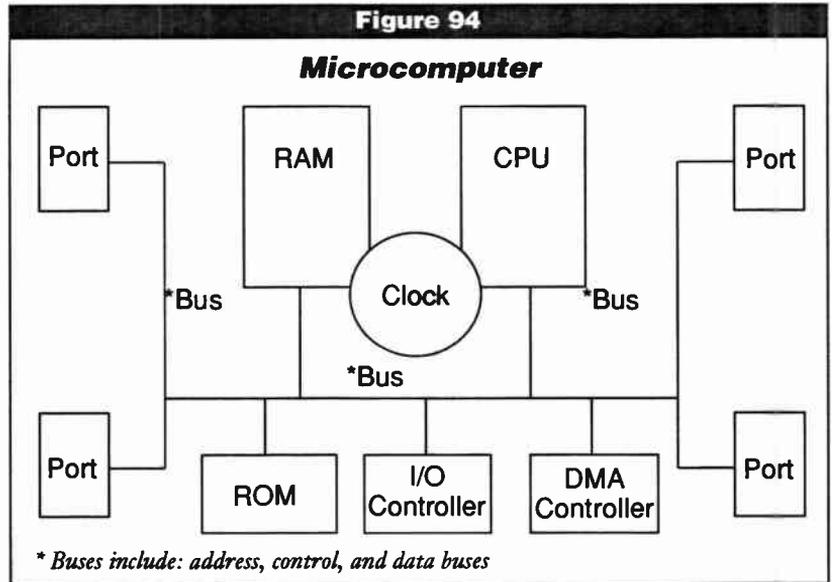
Small integrated circuits (each one-quarter inch square) embedded on thin silicon wafers measuring 5-inches in diameter. When separated, each integrated chip can be used for various electronic

**Microcomputer - Microwave**

functions. The number of components on a single chip has increased greatly over time increasing capacity. (See Integrated Circuit)

**Microcomputer**

Classes of relatively compact, stand-alone computers combining a microprocessor, memory, storage, input device, keyboard, and display monitor. Full-feature desktop computers are much more powerful and run much faster than the first models of IBM PCs (Personal Computers) and Apple's Macintosh computers which are examples of original microcomputers.



**Micron - Micrometer**

A metric system measurement; one micron is equal to one millionth of a meter. Expressed in decimal numbers, 1 micron = 10<sup>-6</sup> meter.

**Microprocessor**

A versatile, powerful set of integrated circuits embedded on silicon wafer chips. The central computing power of a system, for example: Intel's Pentium III processor or Macintosh's G4. Microprocessors direct the performance of all logic, control and memory functions. (See RAM, ROM)

**Microwave**

A portion of the electromagnetic radio spectrum between 1 GHz and 200 GHz used for satellite, terrestrial point-to-point communications, and cellular telephone services. Microwave frequencies also are used in kitchen microwave ovens to heat food essentially by vibrating liquid (water primarily) and other molecules at designated microwave frequencies.

**Table 32**

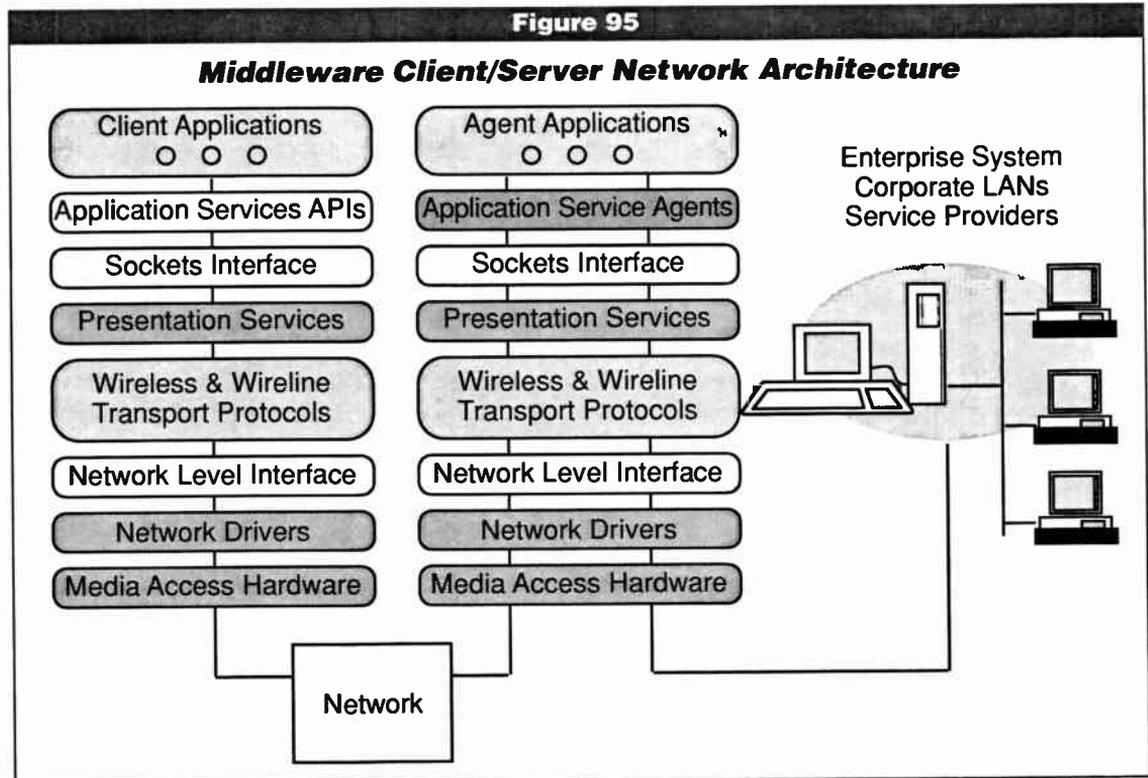
**Microprocessor Standards**

Date	Intel CPU Name	Clock Speed	# of Transistors (000s)
1978	8086	5 - 10 Mhz	29
1979	8088	5 - 8 Mhz	29
1982	80286	8 - 12 Mhz	134
1985	80386	16 - 33 Mhz	280
1989	80486	25 - 50 Mhz	1200
1993	Pentium (P5)	60 - 200 Mhz	3100
1995	Pentium Pro (P6)	150 - 200 Mhz	5500
1997	Pentium II	233 - 400 Mhz	7500
1998	Pentium III	400 - 866 Mhz	14000
2000	Willamette (P7)	1.5 GHz	NA
2014 (projected)	NA	3.6 GHz	64,000,000

*Source: Industry*

## Middleware

General term used to describe software that connects two previously unconnected computer applications or systems. One of the most common examples is the use of software to connect Web servers and stored databases. (See Active Server Pages, Common Gateway Interface, Cold Fusion, E-Commerce)



Source: River Run Software Group, Inc.

## MIDI - Musical Instrument Digital Interface

A software interface system designed specifically to connect electronic musical instruments, such as a digital music synthesizer or keyboard, directly to a computer.

## MIME - Multipurpose Internet Mail Extension

The standard for attaching non-text files to standard Internet mail messages. Non-text files include graphics, spreadsheets, formatted word-processing documents, audio sound files, etc. The standard is a way of specifying the type of file being sent and the method to convert the file back into its original form. It defines restrictions on content such as allowing for multiple objects in one message, unlimited length of messages, and multiple fonts within a message. MIME standards are specified by Internet document RFC 1341 and are identified with a specific file extension label. (See Attachment, E-mail Attachment)

## Mini-Notebook

A class of personal laptop computers weighing between 2 - 4 pounds, falling somewhere between the smallest handheld personal digital assistant (PDA) devices and fully equipped laptop computers. Mini-notebooks are growing in popularity and designed to function more like a regular

**MIPS - MMDS**

laptop or desktop computer. One downside is that mini-notebook keyboards, screens and hard drives are usually smaller than notebook laptops.

**MIPS - Million Instructions Per Second**

An approximate measure of the rate at which a computer executes or performs software or hardware instructions. Higher MIPS rates are needed to perform complex calculations at reasonable speed but complexity and speed translate into higher costs. For comparison, Intel's 286 chip handles instructions at 1 million instructions per second or 1 MIPS, whereas Intel's newer Pentium chip runs at 100 MIPS. This may be even more than a 100-fold increase because the size of the instruction-set also has expanded taking up more time in transmissions.

**Mirror**

Often used to speed up the transfer of information on the Internet, a mirror is an archive site or website that keeps a copy of some, or all, files at another site to make those files more quickly available to local users and to reduce the load on the source site. Popular websites receiving hundreds of thousands of visitors daily commonly employ mirrors to assure that they can deliver all of their Web pages as quickly as possible. (See Cache, Internet, Web Server)

**Mixing Console**

A device allowing two or more audio or video signals to be combined or mixed. The levels of each signal can be manipulated by a console to make one signal stronger or more dominant than another signal during the mixing process to creating layering effects on the final output.

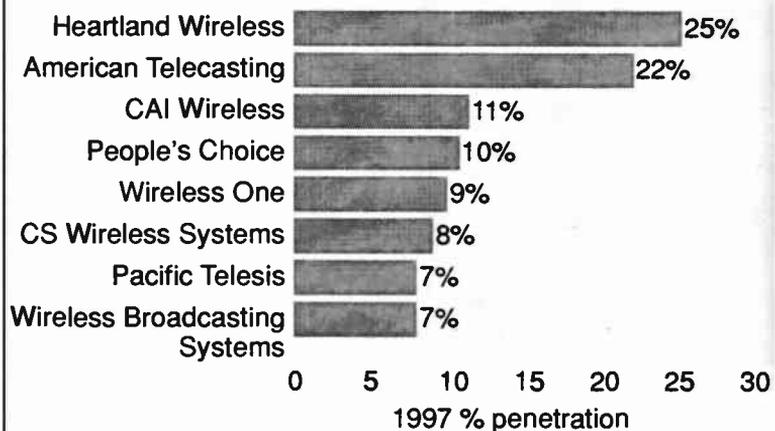
**MJPEG - Moving JPEG**

A compression algorithm designed primarily for video or still-picture frame-by-frame digital editing. (See JPEG, MPEG)

**MMDS - Multichannel Multipoint Distribution Service**

MMDS and LMDS are referred to under the umbrella term of broadband wireless fixed access (as distinct from wireless mobile) services. Formerly these providers were referred to as parts of the wireless cable industry, but technical capabilities and new services have enlarged the scope and competitive business aspects of these operations, hence the updated

terminology. In the U.S., MMDS operations are transmitted using microwave frequencies in the 2 GHz band. Services often are provided on leased channels on a shared-use basis with ITFS and OFS services, which originally were allocated these frequencies by the FCC. Wireless broadband

**Figure 96****U.S. MMDS Systems With Highest Penetrations**

Source: The Strategis Group, Inc; courtesy of Wireless Communications Association International. Contact [www.wcai.com](http://www.wcai.com).

MMDS and LMDS systems are relatively short-range (25 miles) fixed point-to-multipoint services. System construction and operations are very cost-effective for delivering competitive multichannel video services, and have produced growing demand for broadband wireless access in many global regions that do not have other multichannel providers such as cable or satellite DTH services. New digital MMDS systems are being built around the globe. The fixed broadband platform has major advantages in the race to first-to-market for high bandwidth applications including Internet access, e-commerce, competitive telephony, data as well as multichannel video. (See Broadband Wireless Access, LMDS)

### Mobile Data

Refers to the growing wireless mobile data communications market. (See Wireless Data, Wireless Mobile)

### Mobile Satellites

Refers to satellite communications services proposed by a range of companies to provide mobile users with worldwide phone, messaging, computer data, vehicle location and positioning, and other services. Systems being planned include proposed launchings of hundreds of satellites in low earth orbits (LEO) to create future worldwide mobile communication networks that can reach anyone, anywhere on earth, at any time. (See MSS)

### Modem - Modulator/ Demodulator

An electronic device for modulating analog signals for transmission over a standard telephone copper twisted-pair lines or demodulating received analog signals. Particularly with computer modems, these devices also convert digital signals into analog form or reconvert them from analog to digital if sent to another computer system. Except in the case of an ISDN line, home PC users need to use a telecom modem for sending faxes or files over the Internet because residential lines are still analog not digital facilities. (See Cable Internet Access, V.90)

Data Rate	28.8 kbps	33.6 kbps	56 kbps	128 kbps	1.5 Mbps
Download time for a 100k Web Page	35 seconds	30 seconds	19 seconds	8 seconds	0.6 second
Download time for a 10Mb file	58 minutes	50 minutes	31 minutes	13 minutes	1 minute

Source: Wireless Internet Services, Inc.

### Modulation

Changing the characteristics of a signal carrier wave from a baseband signal to that which can be used for transmitting information. Modulation techniques combine multiple signals into a single transmission form that can be reversed at the receiving point to recover the embedded information.

### Monitor

A type of video display device. (See CRT)

### MOO - Mud, Object Oriented

A role playing area on the Internet designed for interaction among many users. A type of MUD. (See MUD)

## Moore's Law - Motion-Capture Bodysuit

### Moore's Law

A commonly cited maxim by Gordon Moore, a co-founder of Intel who observed in 1964 that "the speed of integrated circuits (chips) was doubling every twelve months." He predicted this pattern would continue into the foreseeable future. Chip processing power actually has doubled approximately every eighteen months, but the pattern has been upheld firmly, and promises to continue for some time. Due to these rapid increases in technical computing capacity has driven down the costs of computerized systems almost exponentially. Combined these elements are the foundation for today's digital revolution and the driving force behind the convergence of the computing, communications, networking and information industries worldwide.

### Morphing

Short for "metamorphosing," it refers to the process of gradually changing or turning one image into another image. Morphing is a common technique in animation and special effects work. (See Tweening)

### Mosaic

The first graphical Internet Web browser that was instrumental in popularizing the Internet as it made navigating the network considerably more manageable for users. In making Internet browsing more accessible, surfing or cruising the Net became a national pastime. Mosaic was an early version of Netscape, leading Web browser software, which offers additional features. (See Browser)

### Motherboard

The main interconnection circuit board in a computer that provides connectivity among the Central Processing Unit (CPU), memory, all internal and external devices, and peripheral hardware. (See CPU)

### Motion-Capture Bodysuit

A set of integrated body-mounted motion capture components for producing 3D character animations for television programs, movies, video games, virtual reality sessions, or live performance animation presentations. Non-entertainment applications include sports medicine and physical rehabilitation medical analyses, biomechanical device testing, virtual prototyping, CAD simulations of human motions for developing a range of commercial products from ergonomic chairs to driver seats in cars. Wireless motion capture bodysuits use a series of extended range transmitter sensors that emit pulsed magnetic fields to track body position and physical orientation. Sensors are mounted at key body movement points and sensor data travels via cables to a miniature battery-powered electronics unit mounted in a small backpack unit. Sensor data and other signal data from peripheral head-mounted equipment or motion-capture data gloves are transmitted wirelessly to a base station and then to a host computer in real time. (See Datasuit, Virtual Reality)



Source: MotionStar Wireless®

**Mozilla™**

The original project code-name for the Netscape Navigator browser software development project. Many people assert that the term is a combination of "Mosaic" and "Godzilla." In 1998, Netscape decided to make the source code for Navigator freely available to the public. The Netscape group responsible for distributing and managing the computer code is called mozilla.org, and its website is: [www.mozilla.org](http://www.mozilla.org). (See Browser, Mosaic, Netscape, Open Source)

**MP3 – MPEG-1, Audio Layer 3**

A digital compression format designed to deliver near-CD quality music by reducing digital audio files by about 90 percent. A typical song on a CD taking up about 50 megabytes can be reduced to an MP3 file of fewer than 5 megabytes by optimizing the file based on the sounds that people can actually hear. These smaller files can then be listened to using special software (usually available for free) to decode the MP3 content. The files are easily stored on a server

and transferred over the Internet, can be used to burn custom CDs, or can be transferred directly into an MP3 player – a small portable device about the size of a pager that can store 8-12 MP3 songs. MP3 audio files have quickly become a popular format for digital music due to their sound quality and comparatively small size. The MP3 standard allows a user to compress complex sound files like rock songs into files of only one or two megabytes, unlike previous audio recording formats that create large sized file to capture music in digital form. There are many websites that offer free MP3 songs for downloading for personal listening but do not enable a user to create a copy of the file. (See [www.mp3.com](http://www.mp3.com) for information on the format and related material.)

**MPEG – Motion Picture Experts Group**

Refers to an internationally recognized group of professional video experts that has been responsible for developing technical standards for digital video encoding and video compression. MPEG meets under auspices of the International Standards Organization (ISO).

- **MPEG-1** – The first set of digital standards developed by MPEG that includes a compression scheme for motion video. MPEG-1 compresses moving images using intraframe and interframe coding techniques to produce a VHS-quality video transmitted at a data rate of about 1.5 Mbps.
- **MPEG-2** – An updated set of digital video compression standards which is an enhancement of MPEG-1 accomplished through additional coding of video intraframe images using predictive motion techniques which facilitates greater digital signal compression.

**Figure 98**  
**MP3 Devices**

**YAHOO! SHOPPING** 

**Electronics**

**Products Available:**

<p><a href="#">Audiovox</a> <a href="#">Creative Nomad</a> <a href="#">D'Music</a> <a href="#">Diamond Rio</a> <a href="#">Eiger MPMan</a> <a href="#">I-Jam</a> <a href="#">RaveMP</a> <a href="#">Samsund Yepp</a> <a href="#">Memory Cards</a></p>	 <b>Samsung YEPP</b>	 <b>Rave MP</b>	 <b>Audiovox MP-1000</b>
	 <b>DIAMOND</b> <b>Diamond Rio</b>	 <b>CREATIVE</b> <b>Creative Nomad</b>	

*Source: Yahoo! Shopping Electronics*

**MSA - MTS**

- **MPEG-3** – Advanced video compression techniques originally targeted for HDTV systems, but now have been incorporated into the MPEG-2 standard.
- **MPEG-4** – A compression standard used for low bit rate applications such as videophones, multimedia e-mail, and electronic newspapers.

**MSA – Metropolitan Statistical Area**

MSAs are governmentally defined standard geographic areas, which are used by the Census Bureau and frequently by market research companies for reporting various types of statistics. Periodically, the U.S. Office of Management & Budget updates its list of cities and towns, which become officially designated metropolitan areas. The most recent OMB list (published in 1993) defines the geographic boundaries for 253 metropolitan statistical areas.

**MS-DOS® – Microsoft DOS**

The standard operating system (OS) for many personal computers (PCs) before the introduction of Windows NT® and Windows 95®. Unlike earlier versions of Windows® which actually were graphical overlay systems that ran “on-top-of” DOS, Windows 95 and Windows NT, with all their graphical and enhanced features, run using Microsoft’s Disk Operating System (DOS).

**MSO – Multiple System Operator**

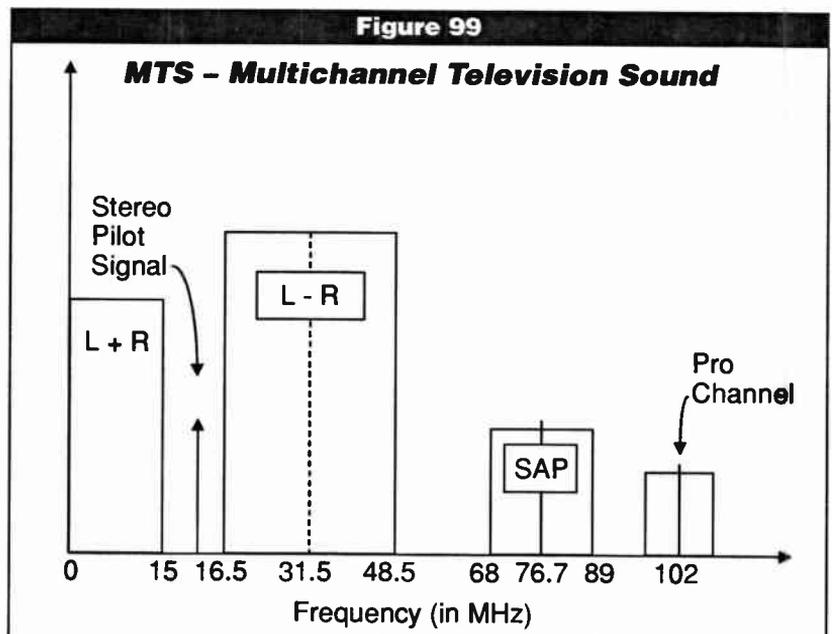
A cable industry term for cable operators that own multiple local cable systems. MSOs are some of the nation’s largest communications companies and include Tele-Communications, Inc. (TCI), Time Warner, Comcast, and Cox Communications.

**MSS – Mobile Satellite Services**

International classification for satellites offering communication services to mobile users generally for links for cellular telephone or other related services. American Mobile Satellite Corporation (AMSC), Inmarsat, Comsat, and Qualcomm’s OmniTRACS provide mobile satellite services transmitted from geostationary satellites. Numbers of low earth orbit (LEO) and medium earth orbit (MEO) mobile satellite systems have been proposed, some already have been disband, others are in Chapter 11 bankruptcy, and still others are pending launch and sorting through the debris left by their predecessors. (See LEO, MEO)

**MTS – Multichannel Television Sound**

Refers to a technical standard for the transmission of stereo audio signals for television. MTS was recommended by the EIA and adopted by the FCC in 1984 and is fully compatible with mono or single audio channel television sets.



TV stereo signals are multiplexed on FM carrier signals and carried as part of the standard 6 MHz broadcast television signal. MTS stereo was developed by Zenith, with noise reduction by DBX, Inc., and includes capabilities for carrying additional audio channels. For example, a bilingual service could be transmitted on the Second Audio Program (SAP) channel, while another audio channel, the Professional Channel (PRO), might be used for commercial datacasting services.

### MUD - Multi-User Dungeon or Dimension

An Internet-derived term for a type of exchange forum or cyberspace "environment" involving multiple user interactions in the creation of fictional situations, conditions or entire virtual worlds or dimensions. User contributions to the "play-action" remain active, even after a user logs out enabling other users to continue to develop the cyberworld action. (See Avatar, Computer-Mediated Communication, MOO)

### Multicasting

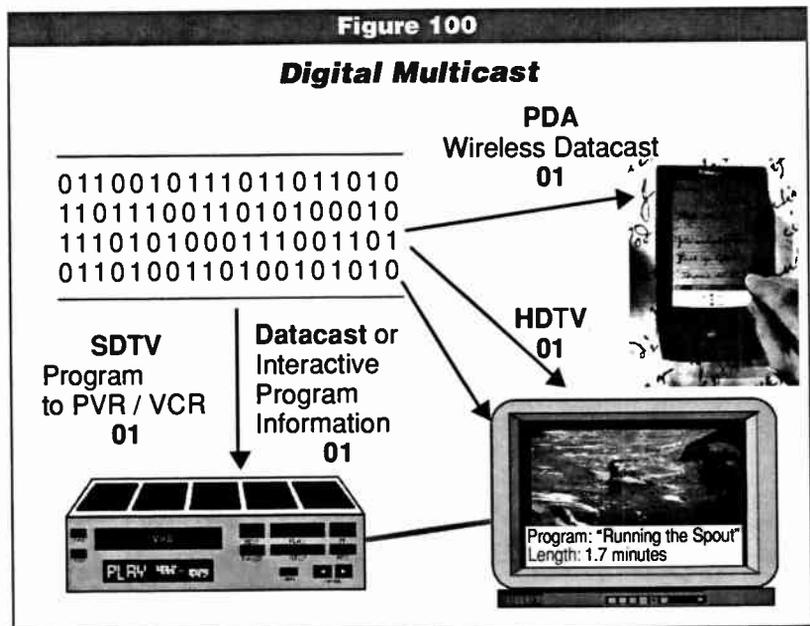
Refers to the transmission of multiple video or audio signals, data and information to numbers of receiver endpoints simultaneously. Video distribution systems such as DBS, MMDS or cable television are common users of multicasting techniques to deliver a range of entertainment programming.

### Multichannel

Refers usually to any video delivery system that transmits multiple channels to end-users employing any number of technical approaches, such as frequency division (FDM) or time division multiplexing (TDM). Examples include cable television, DBS, MMDS, telephone VDT or other video broadband networks. (See Broadband, FDM, and TDM)

### Multimedia

Refers generally to a range of new interactive digital products, systems or services combining audio, still pictures, full-motion video, animation, and graphics, text or other digitized materials available to users for random accessing, manipulation, or creation using special computer software tools. Source material may be stored on a variety of mediums, including CD-ROMs, computer discs, DVDs, videotapes, and offer users opportunities to create their own "interactive" learning or entertainment experience. Multimedia development projects and software development tools are a result of a new generation of high-end computers able to manipulate video, audio, and graphics with increasing speed, sophistication and quality with audio and video outputs rapidly approaching levels achieved in traditional television and corporate post-production studios.



Source: NAB

**Multimedia PC - Multiplexing**

**Multimedia PC (MPC)**

A personal computer certified as capable of multimedia functions including the display and playing of digital audio/music, video, graphics, text, or data information. MPCs also may have editing as well as CD-I or CD-ROM authoring or playback capabilities. MPCs with a Level 3 rating indicate the system has passed a comprehensive suite of multimedia testing.

**Multimedia Server**

A type of electronic server system capable of distributing audio voice/music, video, graphics, text, and data information. (See Server)

**Multi-mode**

Refers to a type of optical fiber that is able to carry various combinations of digital information signals including data, video, and traditional voice signals. (See Single Mode)

**Multiplexing**

Refers to the process of combining two or more signals into a single transmission signal, channel or data bitstream. Multiplexing is used in landline and RF communications systems. When signals are multiplexed, operating networks or systems require precise management time and/or frequencies used in transmissions; such management tasks are often referred to as allocating time and

**Table 34**

**Multimedia PC Standards**

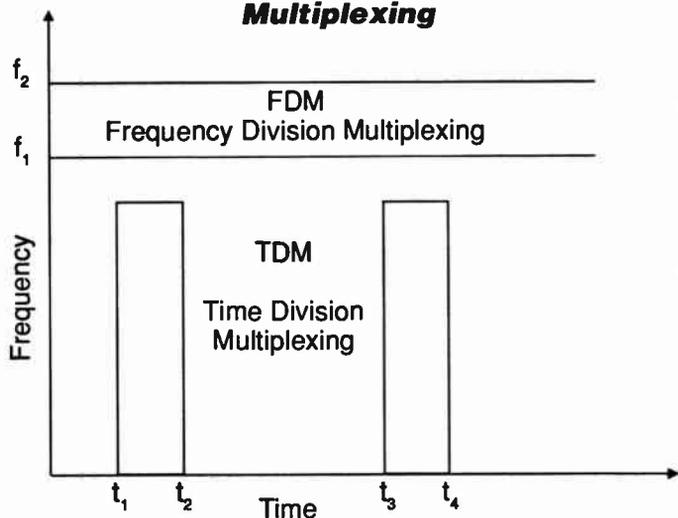
	MPC/Level 1	MPC/Level 2	MPC/Level 3*
PC processor (CPU)	386SX	25 MHz 486SX	75 MHz PentiumTM
RAM	2 MB	4-8 MB	8-12 MB
Hard disk	30 MB	160 MB	540 MB, 15 ms
CD-ROM	1x	2x	4x
Mode 2, multisession	Optional	Mandatory	Mandatory
Sound card	8-bit	16-bit	16-bit wave table MIDI
Video card	640x480, 16 col's	640x480, 64k col's	600x800, 16m col's
MPEG-1	N/A	N/A	352x240/288 @30/25 fps
OS	Win 3.x	Win 3.x	Win 3.1/95

*\* With current PCs having faster processors, faster CD-ROM drives, DVD-ROM drives available, more RAM, barger hard disks, 3D graphics and MPEG-2 available, even MPC Level 3 has been obsolete for some time.*

Source: MPC Working Group, USA Software Publishers Association

**Figure 101**

**Multiplexing**



Source: NAB

bandwidth resources. Multiplexing techniques increase the efficiency of the transmission system and engineers continue to devise or refine multiplexing techniques to achieve higher levels of system efficiency by carrying increased amounts of signal traffic. Typical techniques include frequency division multiple access (FDMA) and time division multiple access (TDMA). Newer digital systems for cellular telephone and personal communications services (PCS) are also examining code division multiplexing (CDMA) techniques. (See CDMA, FDM, TDM)

### **Multisync Monitor**

A type of computer monitor system with inherent software enabling it to recognize the type of device and format of received signals and to adapt to these parameters automatically.

### **Multitasking**

Refers to the ability of a computer system or electronic device to manage more than one task at a time. Operating systems such as UNIX and OS/2 are considered original multitasking systems.

### **MUSICAM - Masking-Pattern Adapted Universal Sub-Band Integrated Coding & Multiplexing**

A data compression scheme developed in Europe for transmitting CD-quality digital sound over limited radio bandwidth channels. The compression scheme separates a digital audio signal into 32 equal sub-bands with bandwidths of 750 Hz, which can transmit at a professional digital sampling rate of 48 kbps. In the compression process, the audio signal also is encoded to take advantage of certain "masking" properties associated with human hearing, such as where a strong signal at a particular audio frequency overshadows a weaker signal at another frequency, causing the human hearing system to not detect the weaker signal. Eliminating these weaker signals in a recording reduces the amount of data needed to digitally represent, without any perceptible degradation to, the restored audio signal. (See Bandwidth, Compression)

### **Must-Carry**

Refers to rules - upheld in a Supreme Court decision in March 1997 - which require locally franchised cable operators to carry all broadcast television signals (public and commercial) within their local markets. The must-carry rule ensures that cable operators offer to viewers all local broadcast television stations. A similar rule for satellite carriers will go into effect in 2002. The satellite rules will require a satellite carrier to carry all local signals in a market if it carries any one local signal under the statutory copyright license.

### **MUX - Multiplexer**

An electronic device for multiplexing or combining two or more signals into a single signal or data stream. MUX equipment also serves to demultiplex or separate the combined signals at the receiving end. (See Multiplexing)

### **MVDS - Multichannel Video Distribution System**

European name being adopted for MMDS/wireless cable operations now being developed. Europe appears headed toward using spectrum allocations in the 40 GHz band for MVDS, or in France in the 3.6 GHz band, whereas MMDS operations in most other countries use spectrum in the 2 GHz band.

**NABTS - Natural Language**

**NABTS - North American Basic Teletext Standard)**

Refers to a proposed high-speed standard for the delivery of data via the existing 6MHz analog (NTSC) television signal. The teletext system per se never materialized as interest in converting to the far more advanced digital HDTV/DTV platform overshadowed the technology.

**Nano**

A measurement representing one billionth of a quantity expressed as  $10^{-9}$  represented as "n" when used as part of a measure of transmission rate. (See Nanosecond)

**Nanosats**

Refers to a new class of miniature satellites being developed by industry laboratories that are intended to replace the large, costly telecommunications satellites in use today. Nanosats are being designed so they can be positioned in clusters in space to provide instant relaying and back-up support to provide advanced telecom services. (See Picosats)

**Nanosecond**

A measurement of time in which one-billionth of a second (or .000000001 seconds) is equal to 1 nanosecond (1n). Often used to express the frequency rate in optical communication systems such as an optical laser, or the transaction rate capability of a computer system.

**Nanotechnology**

Produced by a combination of chemistry and engineering, nanotechnology could usher in an era of self-replicating machinery and self-assembling consumer goods made from cheap raw atoms. Nanotechnology is molecular manufacturing or, more simply, building things one atom or molecule at a time with programmed nanoscopic robot arms. Utilizing the well understood chemical properties of atoms and molecules (how they "stick" together), nanotechnology proposes the construction of novel molecular devices possessing extraordinary properties. Nanotechnology could eventually help produce computers that are billions of times faster than those of today, and it could promote the production of cheap food, energy, and could be used to clean up a polluted environment. While nanotechnology is still in the development phase, there are many U.S. universities and global corporations investing in nanotech research.

**NAPLPS - North American Presentation Level Protocol Standard (or Syntax)**

A protocol developed by AT&T for videotext graphics and screen formats. NAPLPS was established as an ANSI standard as an alternative to more simplistic electronic teletext standards. NAPLPS has a disadvantage in that it takes more time for the information to be transmitted than other text-based transmission systems. (See ANSI in Appendix)

**Narrowband**

Refers to communications systems where transmission channels, links, or lines have relatively limited capacity for transmitting analog or digital signals compared with other facilities that can transmit or carry a significantly greater amount of information. In digital systems, the available bandwidth in different communications systems relates directly to how much information can be transmitted at a particular rate of speed. (See Bandwidth, Broadband)

**Natural Language**

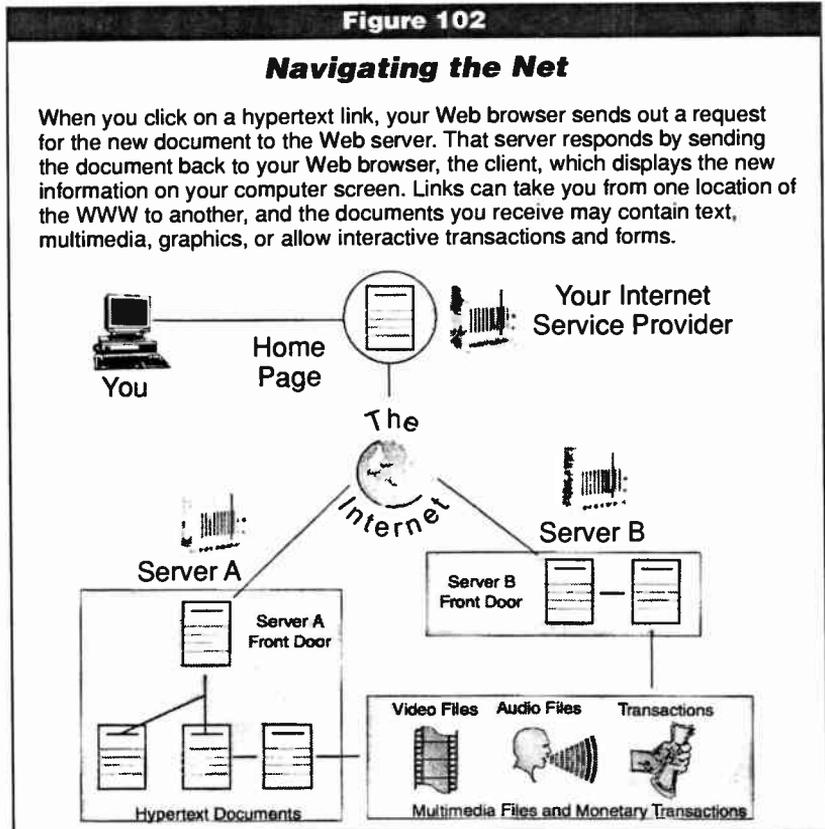
Refers to a language spoken or written by humans, as opposed to a language used to program or communicate with computers. Understanding spoken "natural language" is one of the greatest challenges current facing the field of artificial intelligence due to the complexity and diversity of

**NAB**

human languages, and the semantic problems of discerning various meaning of the same or similar words. For example, English, Spanish, and Chinese are natural languages. Computer languages, such as FORTRAN and C++ are created "languages." Developing computers that can comprehend and respond to natural spoken language is widely regarded as the "Holy Grail" of human-computer interface development. (See AI- Artificial Intelligence, Boolean Search, Interface)

### Navigation Systems

Refers to a growing class of software-based electronic interface systems that allow user-friendly searches, browsing, or surfing of electronic information services, databases, on-line systems, or new 100+ multichannel video services offered by cable, DBS, telco broadband video trials or wireless cable operations. Navigation systems encompass electronic program guides (EPGs) being used by cable operators, Internet Web browsers such as Internet Explorer and Netscape, and a variety of other search-engine and/or intelligent agent software systems. (See IA, Browser)



### Nest

In data systems or software programs, nest refers to placing or embedding one set of instructions within a larger or more generic set of instructions.

### Netiquette

Refers to the conventions of politeness and consideration that have emerged on the Internet, especially in using electronic mail and posting messages to newsgroups. One of the most important rules of netiquette is to avoid sending messages before thinking about how they will impact the receiver (or how they will make you look if the receiver forwards your message to someone else). Netiquette also dictates that one does not forward to someone else personal/private email without the originator's permission. Other widely accepted tenets of netiquette:

- Avoid using all capital letters (unless you intend to be perceived as yelling);
- Keep messages as short as possible; and
- Never (ever) send abusive or threatening messages. (See Chat Room, Computer-Mediated Communication, E-mail, IRC, Newsgroups, Usenet)

## NetMeeting - Network Computer

### NetMeeting™

A teleconferencing tool developed by Microsoft, Corporation, NetMeeting 3.0, which comes with Windows 2000, supports audio and video conferencing, white board, file transfer, application sharing, and e-mail. (See Application Sharing, E-mail, Videoconferencing, White Board)

### Netscape™

Original leader and important force in creating Internet navigation "Web browser" software and other products for the Web; the company was purchased by America Online (AOL) in 1998. (See Browser, Navigation Systems)

### Netware®

A proprietary computer network operating system used by Novell for LANs (Local Area Networks). Netware is a client/server software system providing communication links between client workstations and servers enabling applications, databases, text files and other network assets to be accessed in a shared environment.

### Network

In communications, networks are key foundations for providing services whether it is via broadcasting, computer/data, telephone systems, or other systems.

- In broadcasting, a network refers to two or more radio or television stations linked together for the purpose of sharing programming. Radio or television networks are program distribution networks commonly delivered today via satellite feeds to affiliated stations across the country. Network feeds are established program schedules with national advertising spots already inserted. Networks also may own local stations but are restricted to the same audience caps as other broadcast groups.
- Data networks can be categorized into classes such as Local Area Networks, Metropolitan Area Networks, or Wide Area Networks. A common characteristic among data networks is the interconnections of two or more computer terminals allowing for communication exchange.
- Telephony networks are similar to data networks in that they connect two or more receiving stations. In creating public telephony networks, a guiding principle has been "universal service," whereby any residence desiring connection to the telephone network is eligible to receive service, if at all feasible. Over 94% of U.S. households have telephone service.

### Network Computer (NC) - "Thin Client"

A computer that operates as part of a computer network but depends almost exclusively on a centralized server for the software and storage space that it requires for use. A "thin client" system usually contains a lot of memory (RAM) but has no hard drive storage capacity, and runs on a minimal operating system. There are approximately 5 million users of this approach and generally they are in business environments. NC systems are designed to reduce support costs, as there are fewer full-function computers involved. They allow companies to centralize support functions so that all software upgrades and maintenance occurs centrally on a server. The trend toward this kind of network represents a change in momentum away from the expensive independent PC, toward a more distributed server-centered environment. Distributed-server systems



Source: Microsoft.com

often use a special “boot server” to handle operating system functions, an “application server” to deliver software to the client computers, and a “data server” to store information on the network. (See Application Service Provider, Client/Server, Java)

### Network File System (NFS)

Refers to a virtual disk storage system that uses the same network protocol as the Internet (TCP/IP) to allow computers on any network to share files and disk space in such a way that it appears to the user as a single, seamless file system. For example, this system would make very little distinction among files stored on a user’s hard drive, files stored on a company central computer, and files stored on the Internet, giving that user easy access to any and all files that they had permission to use. (See CFS)

### Network Interface

The point or juncture where a computer workstation is connected to a private LAN network. Also, this refers to the point where a telephone company connects its line(s) to a residential home or business subscriber’s customer premise line and equipment.

### Network Layer

Refers to a particular segment of a proposed open system interconnection model used in telecommunications systems. (See OSI)

### Network Server

A computer system storing database files, text or data files, utility or other application software that can be mutually shared by all workstation computers connected to a local area network.

### Newbie

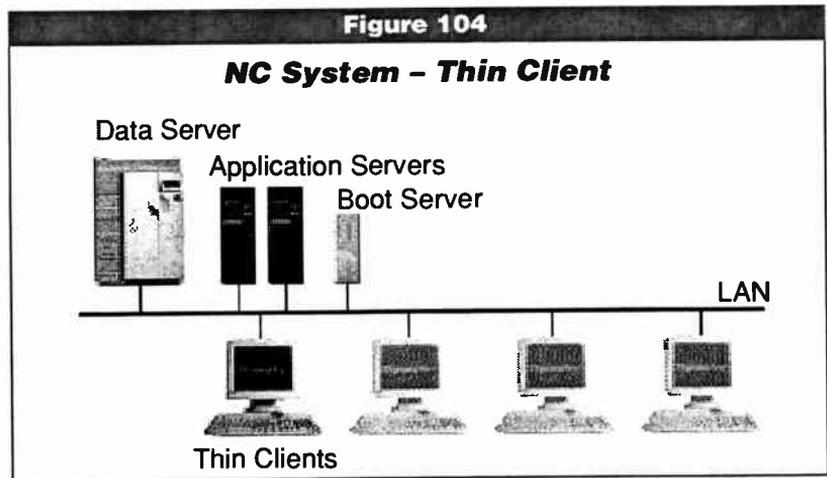
Refers to an inexperienced user especially pertains to new users of the Internet.

### Newsgroups

Cyberspace term for the thousands of different discussion areas or groups, which provide open forums for user exchanges on *Usenet*, some via the Internet others via private on-line networks. (See Alias, Anonymous Remailer, Computer-Mediated Communication, Forum, Netiquette, Spam, Spoiler, Threaded Discussion, Usenet, Virtual Community)

### Next-Generation Internet (NGI)

An effort separate from those working toward “Internet 2,” NGI has been initiated by the Executive Branch of the U.S. Government. Funded by Congress, NGI involves several Federal agencies, including the Defense Advanced Research Projects Agency (DARPA), the National Institute for Standards and Technology (NIST), the National Aeronautical and Space Association



**NIC - Node**

(NASA), the National Science Foundation (NSF), and the Department of Energy (DOE). Efforts are being focused on delivering high-speed network access to as many American citizens as possible as soon as possible. NGI received more than \$85 million in development money in 1998 compared to about \$3 million for Internet 2. (See Internet 2)

**NIC - Network Interface Card**

An electronic circuit board or card that is installed in personal computers to provide interface connectivity for a workstation or PC to a local network. An example of these cards is an Ethernet NIC installed in each PC attached to an Ethernet network. This NIC allows the PC to transmit and receive information via the network. Each NIC has a unique number assigned to it and burned into the card for addressing purposes. When a new NIC is attached to a network, in most cases, it broadcasts its address across the network, enabling the other components attached to the network to begin communicating with it. (See IP Address)

**NiCad - Nickel Cadmium**

Material used in making rechargeable batteries, such as for cellular phones or laptop computers. These batteries have longer charge duration than other types of rechargeable batteries.

**NICAM - Near-Instantaneous Companding and Multiplexing**

A technique or process used for compressing multiple radio frequencies or other signals from analog to digital providing near CD-quality sound. Currently being used to send one digital stereo sound channel along with two digital mono sound channels, NICAM also has the capability of adding more options. These options include such features as an additional digital mono sound channel as well as data channels ranging from 352 kbps to 704 kbps.

**Nielsen//NetRatings**

An Internet measurement service collecting data from a panel of more than 38,000 participants while they are actively online using the Internet. Nielsen Media Research, A.C. Nielsen Company, and NetRatings, Inc. jointly offer the Nielsen//NetRatings audience measurement services. The service provides website publishers, media buyers, e-commerce companies, Internet marketers and the financial community with information about how people are using the Internet. The panel reportedly is the largest media research sample of at-home Internet users currently under measurement. The service employs a technology capable of measuring both Internet use and advertising information to provide timely, comprehensive Internet data to the media, Web/Net, and advertising industries.

**NIER - Non-Ionizing Electromagnetic Radiation**

Electromagnetic signals produce "non-ionizing" radiation that, unlike ionizing radiation, do **not** alter the molecular structure of objects contacted. Electromagnetic signals do not dislodge electrons from atoms in objects to create ions. Energy with a short enough wavelength to create ions is not considered to be electromagnetic energy. Cosmic and x-rays are examples of ionizing radiation. TV and Radio signals are examples of non-ionizing radiation. (See RFR)

**Node**

A telecommunications term referring to an electronic device that serves as a point of connection into a network. As an active device, it may provide management capabilities or functions to various network segments or components such as computer LANs, routers, switches, or hubs.

**Noise**

Any electrical energy or stray signals in a line or systems that are not part of the intended signal. Noise is caused by innate properties in all electronic components due to their physical characteristics and small random variations in their structures that generally are associated with their ability to produce heat or increase temperature, and thus add interference or noise in a system.

**NOI - Notice of Inquiry**

An NOI is issued when a federal agency, such as the Federal Communications Commission, is seeking information on a broad subject or trying to generate ideas regarding the basic direction on a matter or policy. In an NOI, the FCC would ask for input from any/all interested parties regarding a particular issue that is to be examined. A period of time is usually specified during which interested parties may submit comments. The FCC, or any other agency, cannot adopt final rules in an Inquiry proceeding; rather it must go to an official rule making stage by issuing an NPRM to set the stage for adopting rules. (See NPRM)

**NPRM - Notice of Proposed Rule Making**

Refers to a procedure under the Administrative Procedures Act in which a formal document serves notice of a specific proposed change to an agency's regulatory rules and regulations. NPRMs allow interested parties, including affected industry representatives, to submit information and written comments regarding any aspect of the pending action including impacts of the proposed rules on existing or future businesses. Typically, an NPRM is issued when an agency believes it has gathered and evaluated sufficient information to make a ruling and is offering an opportunity for public comment.

**NTSC - National Television System Committee**

Refers to the industry committee that developed the existing U.S. standard for color television broadcasting established in 1953. NTSC systems have 525 lines, 4:3 aspect ratio, 2:1 interlace scanning, 4.2 MHz luminance bandwidth for monochrome (black and white) and total color bandwidth of 1.5 MHz. The NTSC system is used for both production and delivery of television programs. Transmitted NTSC signals, with its separate sound carrier, occupy a total of 6 MHz of bandwidth, which is the frequency allocation per station for U.S. licensed television stations. The NTSC color system was adopted because it was backward compatible with the installed base of monochromatic (black & white) television sets. In the NTSC format, the chrominance portion of the color signal consisting of three primary colors for television — red, green, and blue — are coded in vector form and sent on a secondary video subcarrier, and the monochromatic information is included as part of the luminance signal. Home receivers extract the color information to reproduce full-motion images on set display screens through an interlaced scanning process. The NTSC scanning rate is 60 Hz for 525 lines of television signal information, of which 484 lines normally contain video picture information. (See Interlaced Scanning)

**Number Portability**

Refers to the ability to retain the same phone number when switching from one type of telecommunications service provider to another.

**NVOD - Near Video-on-Demand**

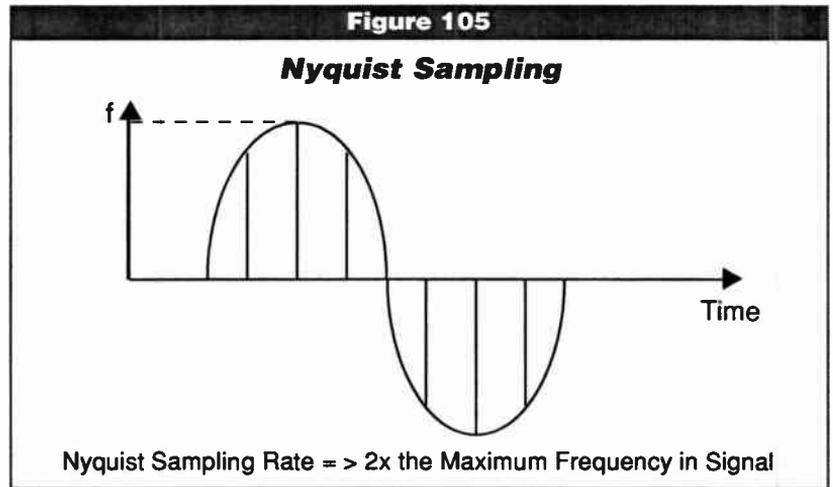
Refers to video delivery systems currently in development that are not quite instantaneous or actual video-on-demand (VOD) system. Near VOD systems are offered by cable, MMDS, DBS or in some telephone video trials. These operations transmit pay-movie services at pre-set start times, typically every 15-minutes. (See VOD)

## Nyquist Frequency

### Nyquist Frequency

This is a fundamental principle applied in converting audio and video analog signals into digital form. Nyquist theorized that there is an absolute minimum number or rate at which samples must be taken of an analog signal in order to convert the signal into digital form — and still keep the integrity of the signal. According to the Nyquist theorem, the minimum sampling rate

is twice the maximum frequency in the analog signal that is to be sampled. For example, the sampling rate used in digital CDs is 44.8 kHz, so the highest sound frequency that can be reproduced on a CD is 22 kHz. To sample an analog NTSC television picture signal so that no distortions occur, a sampling frequency greater than 8.4 MHz must be used.



Source: NAB

**Object**

Data structures (sometimes called containers) that conform to specific templates classes and rules. For example, an HTML page may contain a video "object" which is accessed via a hot-link to initiate a streaming video file transfer. Generally, "objects" refer to different types of elements developers may incorporate into documents, databases, programs or other software. (See Mark-up Languages)

**Objects**

In recent computer lexicon, objects refer to sets of re-usable software routines. Object-oriented software combines established routines to create application programs. Object software offers the advantages of fewer development problems and reduced development time cycles. (See C++, OOP)

**OC-3 (Optical Carrier - Level 3)**

Commonly used as a synonym for the 155 Mbps ATM protocol using fiber optic networks - a fast transmission link to send data. (See ATM, Fiber Optics)

**OC Layers - Optical Carrier Layers**

Carrier levels used in synchronous optical lightwave networks. (See SONET)

**OCR - Optical Character Recognition**

The process of scanning text documents with an electronic optical laser scanner device that is able to recognize text characters and convert them to digital format (binary) for subsequent computer processing.

**ODBC (Open DataBase Connectivity)**

Refers to a standard developed by Microsoft Corp. that is designed to make it possible for users to access any data from any application, regardless of which database management system is handling the data. Using ODBC-compliant database management systems allows companies to integrate and combine information that is contained in many different types of databases. (See Cross Platform)

**OEM - Original Equipment Manufacturer**

Any company that is the original maker or manufacturer of a particular equipment product that is later licensed to be manufactured and marketed by others. In computer retailing, companies often will package video monitors, keyboard or other equipment manufactured by others along with their CPU hardware equipment. The PC packager or vendor will often put their own logo on this equipment, although they are not the OEM.

**Off-line**

Refers to computing or terminal equipment that is not connected to a computer system or network. For microcomputers, off-line can refer to processing that occurs while not connected to the system. The term off-line can also be used to describe an editing technique whereby a finished product cannot be obtained. The advantage of off-line editing is to give the client a quick and dirty version of a possible finished product without requiring a large time commitment (which equals money). Digital editing technologies are making off-line editing an obsolete practice because multiple versions can be constructed instantaneously from an original "finished" product.

**Ohm's Law**

An established law of physics expressing the relationship between Voltage (E), Current (I), and Resistance (R) where:  $E = I \times R$ . Voltage is expressed in Volts, current is expressed in Amps (Amperes), and resistance is expressed in Ohm's.



**OLE - Online**

**OLE™ - Object Linking and Embedding**

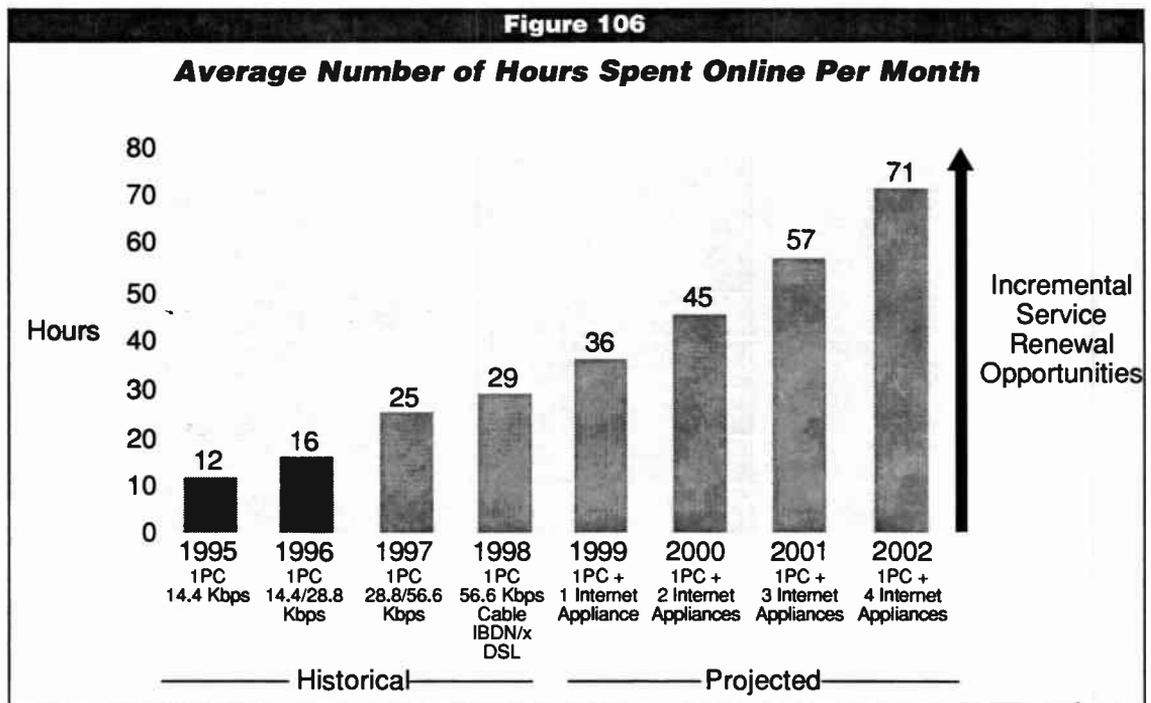
Known as “document component technology,” OLE was developed by Microsoft to allow separate elements of a document or “objects,” such as text, images, sounds, to be built by separate programs but then be recombined into a single document. Each object can still be edited by its source program (usually by just double clicking on the object), and changes are reflected in the master document. For example, a user could create a spreadsheet in Microsoft Excel and then copy that spreadsheet into Microsoft Word. The user while in Word, can double-click on the embedded spreadsheet and make changes without ever leaving their word processor. If the spreadsheet is updated in Excel, the information contained within the Word document is automatically updated. (See Objects)

**On-Demand**

A term referring to the instant retrieval for viewing, listening, or reading of audio, video, or data content for the convenience of consumer users. Video-on-demand (VOD) has been a much sought after “future” market for cable and other wireline broadband services to develop as home-delivery services. The technology - including computer servers, in-home receivers, and networking systems - for VOD implementation are very costly and have dampened if not completely extinguished business enthusiasm for VOD in the past five years. Alternative systems are in development due to the rollout of digital television (DTV) and pending upgrading of much of cable’s plant (read: AT&T) to facilitate the delivery of digital broadband VOD services to home consumers. (See Interactive Television, VOD)

**Online**

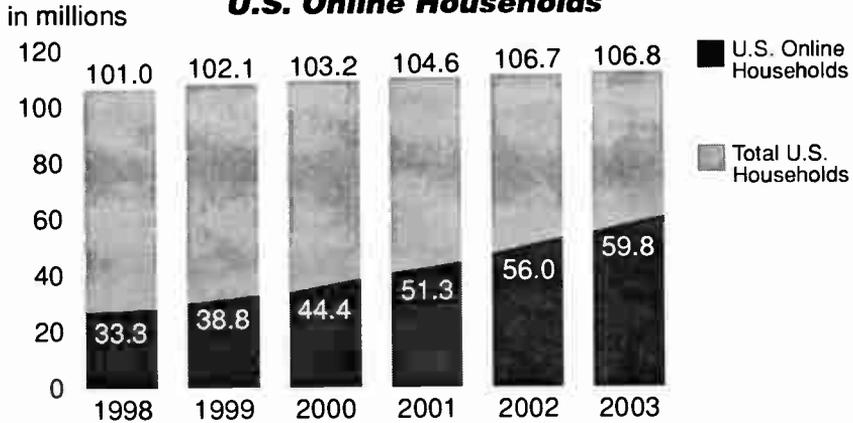
Refers to connecting via phone or cable modem to the increasingly vast number of global public and private network-based information services offering users free access, or at times subscription fee-based access, to an abundance of data, text, video, graphics or other information and services over the Internet. (See Internet, Web, Website)



Source: Hambrecht & Quist

**Figure 107**

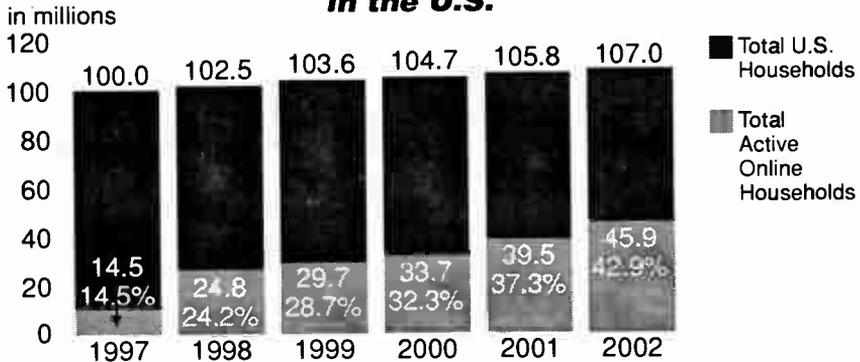
**U.S. Online Households**



Source: Jupiter Communications, June 1999

**Figure 108**

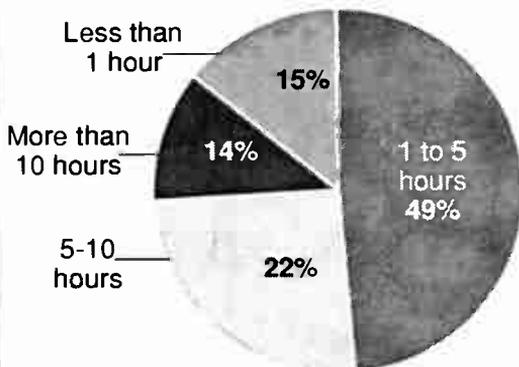
**"Actively" Connected Online Households in the U.S.**



Source: eMarketer, 1999

**Figure 109**

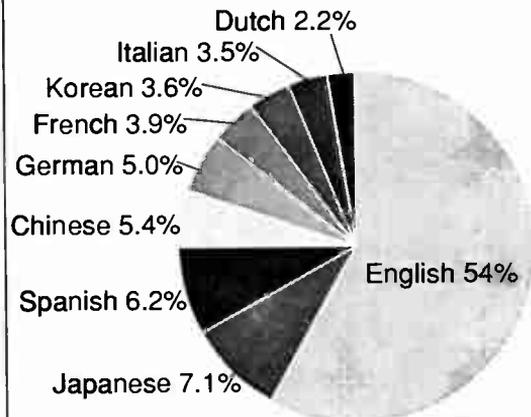
**Time Spent Online Per Week**



Source: Stanford Institute for the Quantitative Study of Society, 1999. (From a survey based on a nationwide random sample of 4,113 individuals over the age of 18.)

**Figure 110**

**Online Language Populations (February 2000)**



Source: Euromktg.com

**Online Forum - Open Source****Online Forum**

A virtual site for conducting asynchronous online discussions. A forum is a public discussion site or space where Internet users can log into a computer site to read and send messages to members within the group. The posted discussion messages are available for all members of the group to read and respond to at their convenience. (See Newsgroups, Usenet)

**Online Services**

A growing market of commercial and public information networks offering consumers computer or enhanced set-top box modem access to a host of data and information sources. The Internet and World Wide Web are leading public online networks with commercial online portals such as America Online (AOL), Yahoo!, and many others. Web navigation is managed through graphical user interface (GUI) software either provided as part of the online service or via a Web browser. (See GUI, Navigation, Portal)

**On-the-Fly Pages**

HTML pages built dynamically (or "on the fly") from a database with user-provided parameters (e.g., a weather page for a given local city). On-the-fly Web pages are created at the request of a user using pre-programmed criteria. Once the information has been received from the user, software running on the Web server builds a customized Web page or graphic at the time of request with the latest or appropriate information. (See Active Server Pages, Cold Fusion, Common Gateway Interface)

**OOP - Object Oriented Programming**

In computer software development, OOP is a structured methodology for creating software applications or tools that relies on taking objects (i.e., re-usable segments of software) from previously developed programs and re-combining them in ways to create new finished software products. (See Objects)

**Open Architecture**

Refers to computer, telecommunications or other communication network systems that are designed with little if any restrictions on the types of inputs or equipment, software interfaces that can be used with the system. Open architecture systems are non-proprietary although they may involve licensing patented technology to allow competitive products, or compatible software or hardware to be developed. (See OSI).

**Open eBook Standard (OEB)**

Refers to a late 1999 agreement on the part of publishers, hardware manufacturers, and software developers on an open standard for formatting and presenting digital content. The standard ensures that appropriately formatted content can be viewed on any OEB-compliant system. The approval of this standard is likely to encourage publishers to begin mass-marketing digital texts that can be read on personal computers or special digital reading devices (called "ebooks"). (See Information Appliances, "Palm-top" Computing)

**Open Source**

A method and philosophy for software development, licensing and distribution. The approach is designed to encourage the use and improvement of software written by volunteers in that anyone can copy the source code and modify it freely. Suggested changes, if approved by the open source community, can be incorporated in the working version of the open source product. One of the best large-scale examples of an open source development project is Linux. (See Linux, Mozilla)

**Open System**

An electronic communications, computer or telecom system standard where the technical specifications are readily available to equipment manufacturers, program developers, content providers, or others. Open systems enable third-party vendors to incorporate the standard into their products or systems to make the compatible with a wide array of existing systems, equipment, or devices, or future upgrades of these products. (See OSI)

**Open Systems Interconnection (OSI)**

Refers to a set of program design principles or “reference model” used to guide the development of data communications system intended to enable equipment from different manufacturers to “communicate” or share data files using a common set of system protocol standards. (See Protocol)

**Operating System (OS)**

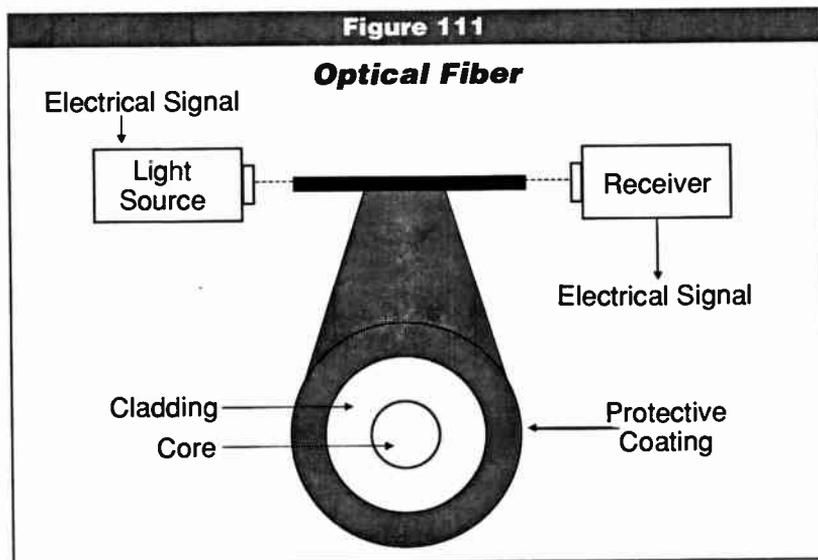
The underlying software system that manages internal computer functions and processes. Computer operating systems, along with basic CPU design, determine which software applications can be processed on the system. (See DOS, UNIX, Windows)

**Optical Disc**

Optical discs operate on a principle in which two different reflective properties are stamped onto a single plastic disc surface. Discs are “read” by using optical laser beams to reflect embedded information off of the disc surface. Due to their large capacities, optical discs are being used for program application software or peripheral storage devices for recording major database and other information files. (See LASER)

**Optical Fiber**

Transmission medium constructed of bundles of hair-thin glass or plastic fibers, which transfers information through the use of modulated lightwaves. Optical fiber provides extremely large bandwidth capacity and is able to transmit multiple quantities of digital information at much faster rates than traditional twisted pair copper wire, coaxial cables, or most other traditional transmission mediums.



Source: Bellcore

**OROM – Optical Read Only Memory**

Refers to optical discs designed for data storage, which cannot be recorded on, or over. OROMs operate similar to CD-ROMs. (See CD-ROM)

**OS - Out-of-Band Signaling****OS**

(See Operating System)

**OS/2 - Operating System 2**

A multitasking operating system developed by IBM and Microsoft for use with IBM PCs, specifically the PS/2 model. OS/2 was a competitor to the more widely deployed UNIX multitasking operating system originally developed by AT&T but has been largely abandoned in favor of MS Windows.

**OSA - Open System Architecture**

(See Open Architecture)

**Oscillator**

An electric device used to create or generate a single radio frequency (RF) signal.

**OSI - Open Systems Interconnection Model**

The International Standards Organization's, Open System Reference model is one of the means by which systems can become connected and interoperable. This is made possible by dividing the information infrastructure into seven architectural layers. Standards are developed for each hierarchical layer. The objective of the OSI model is to enable developers to

build products for any given layer without worrying about how these products relate to the other layers. For example, an "application" could be a video-on-demand service, or it could be a word processor. The other layers, such as presentation, session, and transport refer to technical operations. As one moves through the hierarchy, the layers above and below can be ignored from the developer's perspective. Use of the OSI standard means that a developer of an application like a video-on-demand service does not have to care what kind of transport system is used. Likewise, programmers writing a word-processing program do not have to worry about what kind of monitors their customers will be using. In the OSI model, also referred to as the "7-Layer Model," each layer represents a different class of responsibilities for proper communication within, and between, digital computer/telecommunication transmission networks.

**Out-of-Band Signaling**

Refers to use in ISDN networks where the signaling information is physically or virtually put on a separate channel (D channel) from the main channel carrying customer information. Out-

**Table 35****Open Systems Interconnection (OSI) Model**

Layers	Examples
Application	Images displayed on computer screens
Presentation	Responsible for encryption and compression of information
Session	Provides the communication dialog rules for telecom lines set up by the Transport layer
Transport	Manages the delivery of information on both ends of the network
Network	Deals with data transfer and routing of information within and between networks
Data Link	Concerned with operation of communication lines
Physical	The part of the system dealing with transmissions over a physical medium

of-band signaling is used for transmitting network control signals such as for call set-up and monitoring, and can be accomplished in two ways. One is by using an exclusively reserved portion of the main channel bandwidth and the other is to use an entirely separate network or line. (See SS7)

**Output**

Used in reference to computers and data transmissions, output refers to any type of resulting signal that is produced, transferred, transmitted or otherwise sent out of one device or system to another source.

**Outsourcing**

Distributing or farming out parts of a project to different companies specializing in particular fields or with particular expertise. An increasingly popular way of specializing in certain areas to complete complex projects while keeping company staffing levels low.

**Overlay**

A computer software technique for re-using portions of system RAM memory by replacing an existing set of instructions not currently needed for system controls or software functions with new instructions. This technique allows programs to work using less system memory. Another overlay example is the first version of Windows, which ran “on-top-of” the underlying DOS operating system. Once the “front-end” or overlay was installed, keyboard keys took on different functions although these systems fundamentally still ran on the DOS operating system.

**Overload**

Any situation where a system, channel, circuit or even individual person is inundated with too much to handle, be it electrical power, current, transmitted signal data, or information. System overloads produce power surges, unacceptable error rate, system delays, traffic gridlock, and systemic breakdowns. Protection techniques to regulate system flow, even out damaging surges, error conditions and breakdown are integral parts of an efficient system design.

## PABX - Paging

### PABX - Private Automatic Branch Exchange

Another name for a PBX system. (See PBX)

### Packet

Digital telecommunications term for a cluster of binary information. Packetized data is used in various networking transmission techniques where digital information is divided into small segments to increase transmission rates and system efficiency.

### Packet Switching

An effective, efficient method of transmitting digital data through a corporate, national or international network where digital information is packetized or broken into small clusters with each packet including the addresses of where it originated and where it is being sent. Packet switched networks transmit packetized information by many different routes over the network. The data is digitally reassembled at a receiving end for delivery to an end-user. Packet switching is the method used to transmit data on the Internet.

### Paging

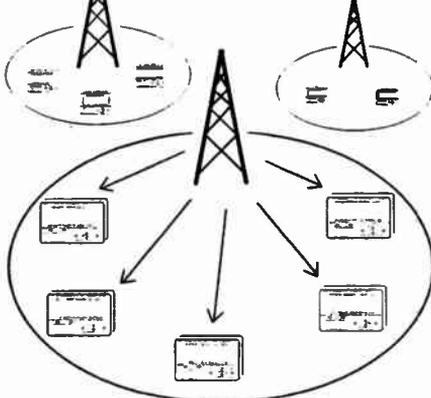
Refers to a growing wireless communication paging/messaging market for delivering messages and other digital information to mobile users. Wireless one-way paging networks can deliver numeric messages entered from a telephone keypad and delivered using various beeper, vibrating, or signaling techniques. Options include sending coded fixed messages such as "call home" or "call school." Alphanumeric paging enables users to receive messages from computers equipped with a modem and special paging software. Messages can be delivered to PCs, PDAs, laptops, or other wireless portable equipment or devices. Newer alphanumeric pagers can deliver up to three lines of text messaging capacity. A growing segment of the paging market is two-way paging (or narrowband PCS) which provides guaranteed delivery of messages, e-mail, and other informa-

Figure 112

### Paging Operations

#### 1-Way Paging

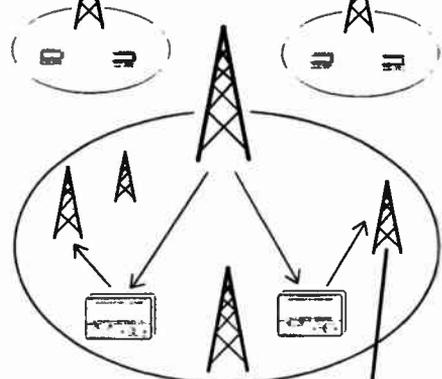
All transmitters in all cities send the same message



All pagers receive the same message throughout the coverage area

#### 2-Way Paging

Only closest transmitter sends message to a subscriber



Responses go to several small receivers throughout the coverage area

Source: NAB

tion, and permits users to receive and acknowledge the message with a brief return response.

### **PAL - Phase Alternate Line**

PAL is the dominant European standard for broadcast television transmission; the standard is incompatible with the NTSC television format. The field frequency is lower than NTSC in that screen images are refreshed at a rate of 50 Hz rather than

60 Hz — which is partly due to the higher amount of picture resolution. PAL signals contain 625 scan lines compared to only 525 in NTSC. Another advantage is that PAL is less prone to phase shifts in color as a result of reversing the (R-Y) (red - luminance) signal for every other scan line. PAL television signals also have greater bandwidth per channel having 8 MHz rather than the 6 MHz standard for NTSC channels. Video television programs recorded using the NTSC-M standard are often transcoded to PAL-M for distribution to Western European countries.

### **“Palm-top” Computing**

A term derived from the growing use of hand-held electronic information organizers such as the PalmPilot™ or palm computers running Windows CE operating system. These small devices are well suited for digital storage of text, data or other information. Wireless versions such as the Palm VII include built-in wireless Internet access for downloading limited data, email or other text material and are key components of the emerging Internet or information appliance market. (See Information Appliances, Internet Appliances, PDA, Web Clipping)

### **PAM - Pulse Amplitude Modulation**

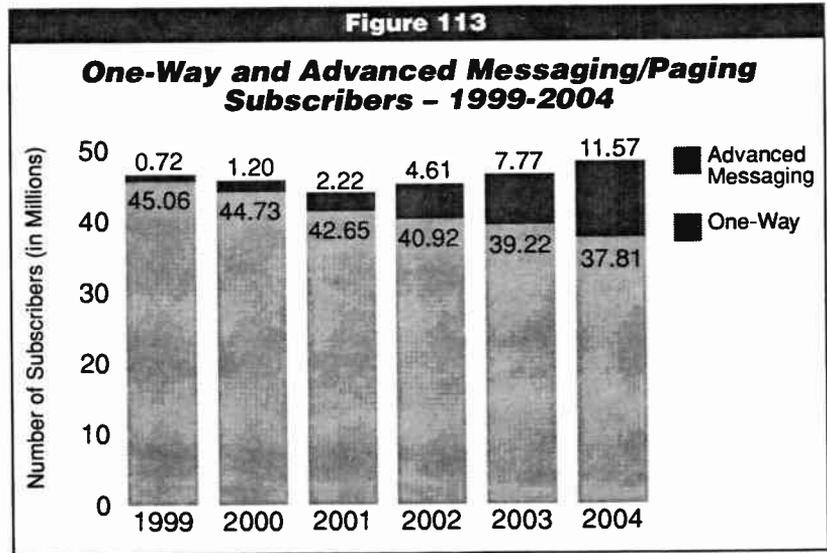
A type of signal modulation technique used in digital communications where a voice signal is digitally encoded using discrete samplings of the amplitude of the signal. The sampling rate adheres to the Nyquist theorem to determine how many digital samples per second are required in order to reconstruct faithfully the signal at the receiving end. (See Nyquist Sampling)

### **Parallel Port**

A multi-wire connection receptacle or interface generally used to connect a computer and various peripheral devices such as a laser printer. Data information sent over an 8-bit parallel port would be transmitted to/from the peripheral device in 8-bit increments, which is in contrast to a serial port which transmits only 1 bit at a time.

### **Parallel Processing**

Refers to the ability of a computer to process or work on multiple tasks simultaneously and is accomplished through the use of multiple processors within the computer system. Massively parallel processing systems use large numbers of internal processors (e.g. 32, 64, or more) operating at the same time. IBM's SP2 system is an example of a massively parallel processing machine.



Source: The Strategis Group, Inc.

**Parity Bit - PC****Parity Bit**

A parity bit is an extra digital bit added at the end of a small 7-8 bit grouping as a way of checking the integrity of the digital transmission. Often a parity bit is added to make the bit group either odd or even depending upon the parity method using. At the receiving end, if the total number of bits received is not odd (in an odd parity scheme), then the receiver knows a transmission error has occurred. Parity checking information is normally part of an error detection-correction data system where few errors are expected, or tolerated due to the sensitivity of the data being transmitted.

**Password**

Refers to a unique set of alpha/numeric characters (often 6 – 10 characters) that is used in conjunction with a unique ID code in order to gain access as a subscriber to a computer account or to a secure portion of an Internet website. (See Authentication, Password, SSL)

**Patch Panel**

In a large communications system, a patch panel is where all input and output sockets are physically converged or centralized. Used for video and data connections, patch panels are for convenience and ease in switching from one input or output source to another.

**Path**

Usually refers to the location of a computer file on a local computer or on a network server and includes information about the file name, the location of the folder, the location of the disk drive, and the location of the computer (if on a network). For example, a path that reads: LAB16\C:\My Documents\NAB\Tech Terms\draft.doc refers to a document called "draft.doc" that's stored in a folder named "Tech Terms" that's stored in a folder called "My Documents" that's located on the C: drive of a computer called "LAB16."

**Payload**

1. In a telecommunications system, this refers to the information being transmitted. When data is transmitted, it is placed into frames with a header attached to help direct the information through the network. The payload is the part of the frame that is the actual desired information.
2. In satellite communication markets, the cargo (i.e., spacecraft or satellite) carried by a rocket launched into space is the system payload.

**PBX - Private Branch Exchange**

A privately owned digital telephone switch located at a business customer's premise. PBXs store information about each line including where it is routed and the types of additional services available to the line (e.g. call waiting, voice-mail). A PBX is also the device that communicates with the local telephone company and other PBXs to establish connectivity between active telephones. Every piece of information stored in a PBX is programmed through a System Access Terminal (SAT), which acts as a server to the PBX.

**PC - Personal Computer**

Generally refers to computers used at home or at work that are stand-alone units not connected to a local network. Computer terminals connected to LANs typically are called workstations, not PCs. More generically, the term PC has come to refer to computers once called IBM-compatible computers, meaning they operated using IBM's original Intel-chip based disk operating system (DOS). The "other" class of personal computers is Apple's Macintosh system that contains a completely different operating system. Mac's are not PCs and vice versa. (See Microcomputer)

**PCM - Pulse Code Modulation**

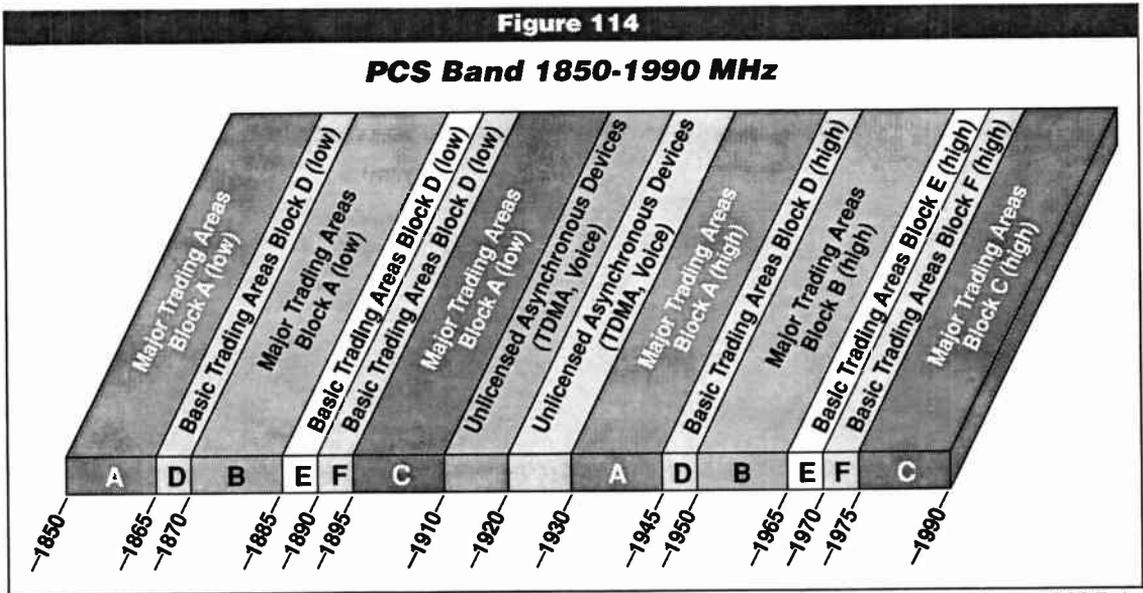
A type of digital modulating technique used in encoding data onto a signal carrier. In PCM systems, individual digital samples are assigned a numerical value, which is converted to a binary code that represents the amplitude level of the sample. The codes are sent to a receiving location one bit at a time. A variant is Differential Pulse Code Modulation (DPCM), which operates in a similar way except that only the difference in the values between two adjacent samples is encoded and sent instead of having to send the absolute value of each sample. DPCM is more efficient by saving some time in transmission. (See PAM)

**PCMCIA - Personal Computer Memory Card International Association**

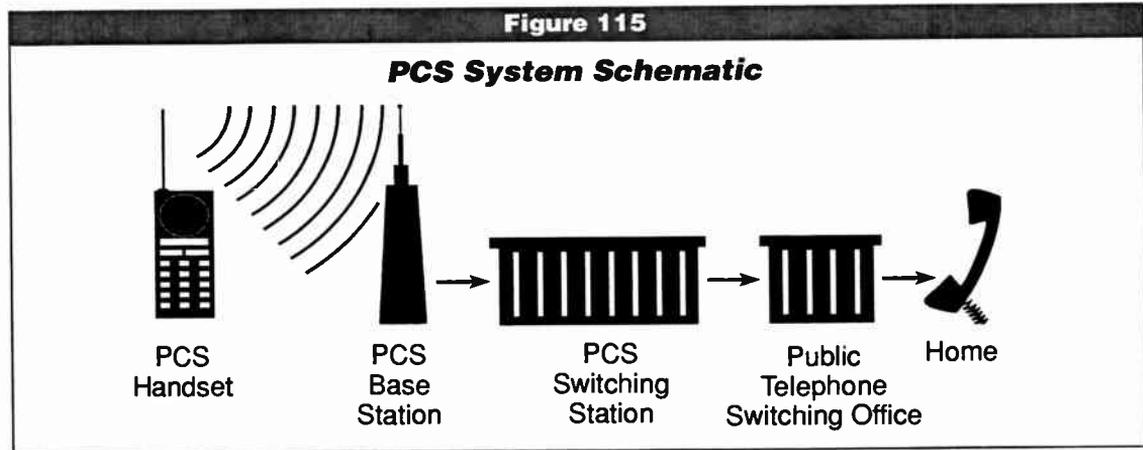
Professional association responsible for setting technical standards for the small add-in memory and modem cards used most often with laptop computers and other portable wireless devices.

**PCS - Personal Communication Services**

A new wireless communication system using advanced mobile technology to deliver services to pocket-sized hand-held phones for personal mobile communications. PCS systems are digital and

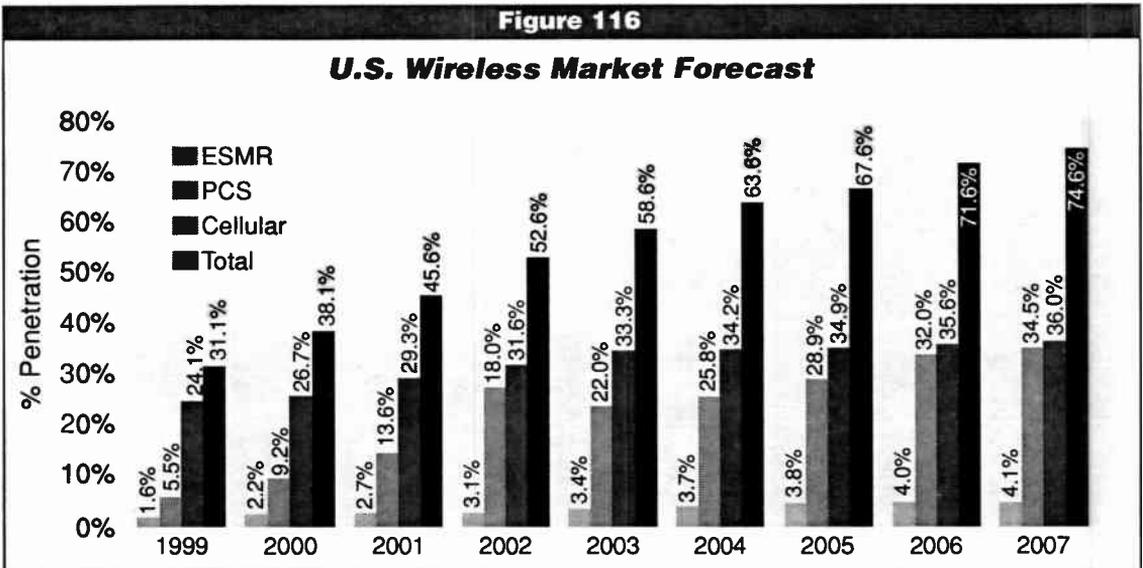


Source: PCS Today



**PCX Format - Peer-to-Peer**

compete with older analog and newer digital cellular phone systems. PCS joins the growing ranks of wireless market businesses offering cell phone, paging, messaging, wide-area computer networks, wireless modems for portable PDAs, laptops and other personal communicator devices. Motorola estimates that PCS could become a \$650 billion dollar industry by the year 2010. (See Bluetooth)



Source: Courtesy of the Personal Communications Industry Association (PCIA), Wireless Market Portfolio, Contributors: Yankee Group, Paul Kagan Associates. Contact: www.pcia.com.

**PCX Format**

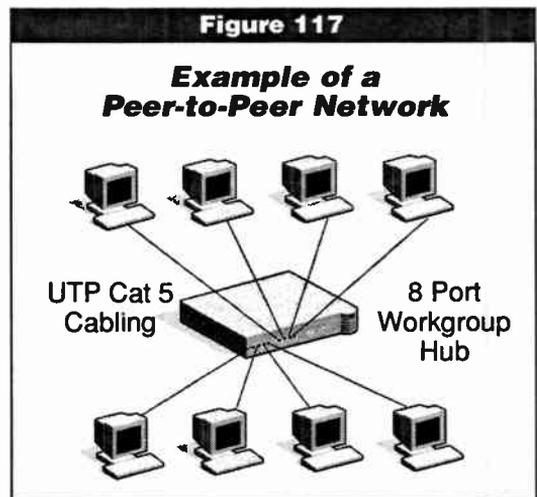
A common computer format for paintbrush software established by Zsoft for IBM clone computers.

**PDA - Personal Digital Assistant**

A developing class of small wireless communicators and other devices ranging from Palm-top computers and electronic organizers to new wireless Internet appliances. PDAs are managing increasing task loads and personal productivity functions. Included are storage of contact address lists and phone numbers, performing calculator functions, establishing Internet connections via a wireless modem for retrieval of e-mail or reception of local datacasting services. Datacasting services range from stock quotes and news summaries to local information on area restaurants, hotels, theater ticketing, etc. (See Handheld, Information Appliances, Internet Appliances, Palm-Top Computing, Web Clipping)

**Peer-to-Peer**

Usually a small number of computers (fewer than 30) that are connected together on a network and can communicate directly with each other, with no central controller or server, to share resources such as files, disk drives, printers, modems, fax machines, scanners, among other items.



Source: WestNet Learning Technologies

**Pel - Picture Element**

(See Pixel)

**PenguinRadio**

PenguinRadio uses a version of the LINUX platform that the company has modified to use a smaller amount of the receiver's memory. PenguinRadio is an established Webcasting portal that is currently broadcasting thousands of radio stations from all over the world over the Internet. It has assigned each of the stations it carries a unique identifying number, which will remain constant even if the station's URL is updated. PenguinRadio carries audio streams in various Internet formats such as MP3, Real Audio, and Microsoft's new \*.asx format. PenguinRadio's website provides links for downloading these and other players. The website is designed to make it easy for Internet users with portable browsers, such as handheld personal organizers or Internet-ready portable phones, to tune in a radio station. It has a separate Web address for these users (<http://www.phoneradio.com>) which is a text-only page with a limited amount of text to make communicating with these smaller devices easier. PenguinRadio has announced an agreement with new satellite provider Ellipso, to market satellite-delivered Internet radio services to cars and other automotive vehicles. Penguins' Ellipso-delivered audio service is to begin in 2002 and will face competition from SDARS companies, XM Satellite and Sirius. The Ellipso/Penguin plan is to sell an aftermarket car radio set that offers customers a choice of up to 10,000 channels vs. the 100 or so channels being offered by XM Satellite Radio and Sirius. (See Ellipso, SDARS.)

**Perigee**

In satellite communications, the point in an elliptical orbit that is closest to the center of the earth and when the satellite is at its fastest speed in the orbit. (See Elliptical Orbit)

**Peripheral**

Any computer system related equipment that is not actually contained within a computer, but is connected to the system via cabling or other connection devices to provide auxiliary services. Peripheral equipment includes printers, external fax modem, external CD-ROM, audio speakers, electronic scanners, or a desktop video camera for desktop videoconferencing.

**Perl - Practical Extraction and Report Language**

An open-source programming language originally developed for Unix systems, Perl is now one of the most common languages for writing Common Gateway Interface (CGI). Perl has powerful text-manipulation functions and combines features and purposes of many different command languages. Perl has enjoyed recent popularity for programming World Wide Web electronic forms and generally as an effective tool for orchestrating the interactions among systems, databases, and users. (See Common Gateway Interface, E-Commerce, Open Source)

**Permanent Virtual Circuit**

(See PVC)

**Personal Video Recorders (PVRs)**

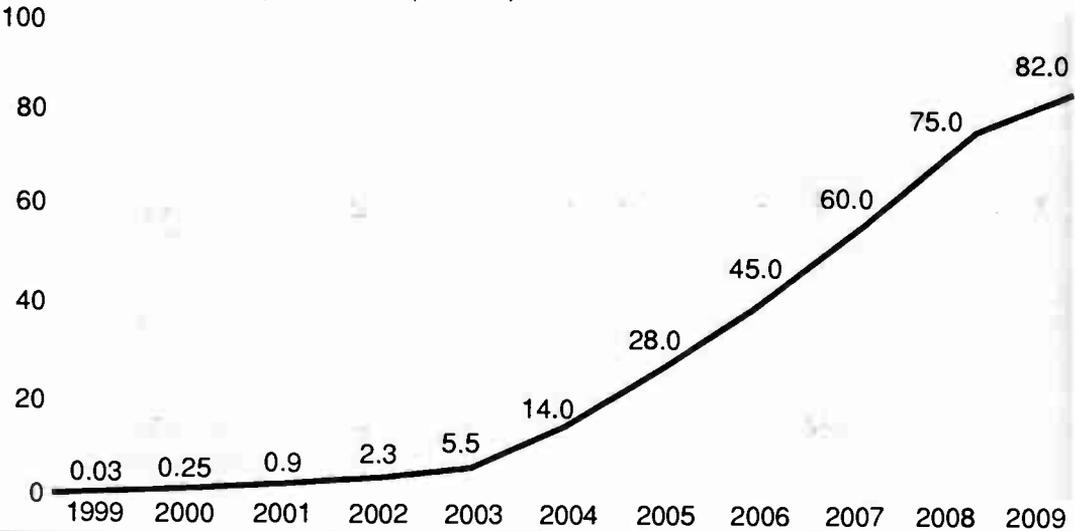
Personal video recorders are consumer electronics equipment similar to some extent to a VCR in that it can record television programming for later playback. But unlike VCRs, personal video recorders are built with computer chip memory capabilities enabling viewers to perform a range of other activities. In particular, PVRs allow users to pause or put a live program on hold and then restart the program where it was initially stopped. Memory capacity in the recorder stores the television program as it continues to be transmitted, thus allowing viewers to return to viewing a live program within minutes or days afterward, without any loss of program content. Other functions include slow motion and/or instant replays of live sports programs or other shows;

viewing a previously recorded program while recording a live broadcast on another channel; automatic digital recording of favorite programs each time they air. Other features include splitting the video input signal to record one program while watching a different channel, also Internet access for E-mail and Web surfing are made possible on certain systems. Personal video recorders work with a variety of video reception systems including local television, cable, and direct broadcast satellites. Major competitors offering a range of products and services include RePlayTV of Mountain View, CA, TiVo, and WebTV Networks, which has been acquired by Microsoft.

**Figure 118**

**Household PVR Penetration**

*U.S. household PVR penetration (millions)*



Source: Forrester Research, Inc.

**Table 36**

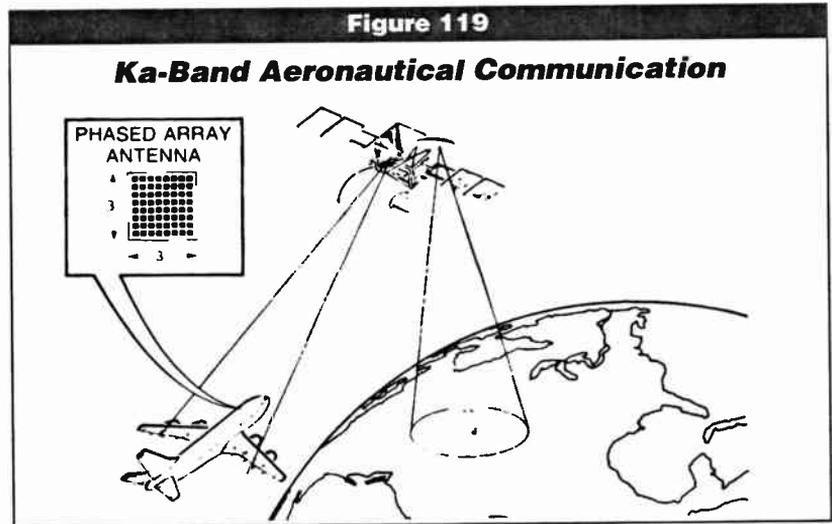
**PVR Players**

	<b>TiVo</b>	<b>ReplayTV</b>	<b>WebTV</b>
<b>Cost and capacity</b>	\$499 (8 hours)	\$699 (6 hours) \$999 (14hours) \$1,499 (28 hours)	\$499 (8 hours)
<b>Monthly charge</b>	\$9.95	Free	\$24.95
<b>Features</b>	<ul style="list-style-type: none"> <li>• Pause live TV</li> <li>• Choose by genre, time, etc.</li> <li>• Over time, PVR learns preferences</li> </ul>	<ul style="list-style-type: none"> <li>• Pause live TV</li> <li>• EPG-based</li> <li>• Viewers create their own "virtual channels"</li> </ul>	<ul style="list-style-type: none"> <li>• Pause live TV</li> <li>• Connect to Web</li> <li>• PVR capability due later this year</li> </ul>
<b>Partners and release dates</b>	<ul style="list-style-type: none"> <li>• Philips DirecTV box expected late 1999</li> <li>• Trials with Sun Country Cable</li> </ul>	<ul style="list-style-type: none"> <li>• No distribution deal yet</li> <li>• Planned ship date: March 1999</li> </ul>	<ul style="list-style-type: none"> <li>• EchoStar box due out spring 1999</li> </ul>
<b>Investors</b>	<ul style="list-style-type: none"> <li>• Vulcan Ventures</li> </ul>	<ul style="list-style-type: none"> <li>• Vulcan Ventures</li> <li>• Marc Andreessen</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft (wholly owned subsidiary)</li> </ul>

Source: Forrester Research, Inc., January 1999.

**Phased Array**

A type of RF electronics transmission technology that operate over a range of different spectrum frequencies simultaneously to diminish or eliminate signal interference. System antennas (such as on-board a satellite) remain relatively fixed in place, but can be electronically steered to receive or transmit in variety of directions. Phased-array antennas are key technical components in the new mobile satellite systems being launched which will enable narrowband phone transmissions from subscribers using small hand-held transmitters similar to existing mobile cell phones.



Source: Insert, June 1990

**PhotoCD**

A standard developed by Kodak for storing digital photographic images on CD-ROM for later use on a computer website, or to send as an attached to an email.

**Photodetector**

A receiver used in optical fiber systems that changes lightwave pulses into electronic signals. There are different kinds of photodetectors used in various optical communication systems. (See APD, PIN Diode)

**Photonics**

A technology based on interactions between electrons and photons, that uses light particles (photons) to transmit data over glass filaments in fiber lines.

**Physical Layer**

Refers to the first layer in the Open System Interconnection Model. (See OSI)

**Picosats**

New miniature satellites under current research and development which are similar in size to wireless phone handsets. Picosats are one of a new class of miniature satellites may be used for future telecom service applications. Two of the minuscule satellites, each weighing under a half a pound, were launched in late January 2000. While operational the two satellites sent and received data transmissions from Earth, but as on-board battery power depleted, the satellites' usefulness ended in about a month's time as expected. The picosat were launched by Aerospace Corporation, and designed so they may eventually replace the much larger and costlier telecom satellites in use today. (See Nanosats)

**PICT - Picture Format File**

A type of picture or graphics compression file format used in transferring pictures from one application program to another. PICT works well for black and white as well as pictures with large areas containing a single color.

**Picturephone - PKI****Picturephone™**

AT&T's trademark name for a slow scan video telephone service and related consumer equipment developed by Bell Labs which enables telephone callers to see as well as talk to each other. The service is delivered over regular copper twisted pair lines, which severely limits the amount of picture information and rate at which it can be delivered.

**PIN - Personal Identification Number**

Refers to a password (a minimal level of security) required authenticate users or customers when attempting to access automated teller machines, computer networks, or secure websites. (See Authentication)

**Pin-Cushioning**

A type of video display distortion seen on computer monitors or television sets in which the outer edges of the picture appear to curve inward. This is the opposite of barreling distortion where the edges appear to be bulging outward. Such distortions result from imperfections in the video scanning process in the monitor equipment.

**PIN Diode - Positive Intrinsic Negative Diode**

A type of semiconductor device used at times as a lightwave detector in fiber optic transmissions to receive optical signals and convert the optical lightwave signals into electrical signals. Also used in microwave transmission systems as a modulator and type of switching mechanism. PIN diodes are made up of intrinsic layers of untreated material sandwiched between positively and negatively treated layers.

**PIP - Picture-In-Picture**

Television set technology enabling viewers to see two or more different pictures or signals in the same screen. Typically one televised picture is displayed in a smaller size than the other. An example of PIP is Smart Window™.

**Pixar**

1. A sophisticated video imaging computing system which can convert ultra high resolution source images (e.g., 2048 x 3072 pixels at 12 bits/pixel) into any HDTV scanning format, such as 1080 x 1920 or 720 x 1280. A system also can generate test patterns in any high-resolution HDTV format. The Pixar system consists of a computer workstation, very fast disk drives, video frame buffers, and a high-resolution monitor.
2. The name of the new billion-dollar 3-D computer animation company headed by Steve Jobs that created the acclaimed film *Toy Story* for Disney.

**Pixel - Picture Element**

In video broadcast and production, a pixel is the smallest unit on a color or monochrome picture screen. Pixels are actively turned on and off or varied in intensity to create a desired visual image or effect. Also called a pel, the numbers of pixels available in a display system are used to express the quality of visual resolution in both television sets and computer monitors. Higher picture resolution requires more pixels.

**PKI - Public-Key Infrastructure**

Evolving electronic infrastructure security system that the government is to assume the certificate authority role and issue root keys from which commercial vendor companies can base encryption strategies. Several leading public-key infrastructure (PKI) vendors, including IBM, Microsoft,

and Entrust Technologies, formed the PKI Forum to speed up the deployment of the security system by resolving interoperability issues among vendors and users. Meanwhile, users, particularly those in the health care industry, are working to come up with a certificate revocation authority. Gordon Romney, president of certificate authority Arcanvs, expects the government will assume the certificate authority role and issue root keys, from which companies can base their encryption strategies. Signs of PKI acceptance in the marketplace include the 500,000-user Healthcare Internet Interoperability Security Pilot, which is scheduled to go live in 2000. (See Clipper Chip)

### **pkZip™/Unzip**

Refers to one of the popular tools for compressing large computer files into smaller ones so they can be easily transported or stored on floppy disks or computer networks. Files that been compacted using PKZIP software are called “zipped” files and must be “unzipped” (uncompressed) for the files to be useable. (See Compression, ZIP)

### **Plain-Text File**

Also referred to as ASCII text, computer files containing plain text letters and numbers have not been encoded or formatted in any way. Plain text is generally considered to be the universal format of computer information, meaning that the ability to read plain text is automatically built into every computer produced. For example, a Microsoft Word file contains formatting information and other encoding that alters the source text with extra instructions. If that Word file is saved as a plain text file, all of the Word formatting is stripped out, leaving only the letter and numbers.

### **Plasma Display**

A developing type of video flat panel display technology, plasma displays measure about three inches thick, with image quality reportedly as good as the best conventional picture tubes and better than any existing rear-projection display models. NEC is moving aggressively into the manufacture of color plasma display panels, which is seen as a strongly emerging market because of new multimedia-based applications and the coming next generation of widescreen TVs and HDTV receivers. (See Flat Panel Display)

### **Platform**

In the converging mega-media, telecom, computer and consumer electronics worlds, the term platform is used in many contexts. Any distinct hardware system, software environment, or network architectural strategy can be a platform. In computer environments, a platform generally refers to the underlying operating system, which determines the basic operating protocol or language. Computers running on the same technical platform can easily share software packages, whereas incompatible platforms are now requiring middleware to manage basic protocol conversion differences. (See Middleware, Operating System)

### **Playback Head**

The electronic converter device in videocassette or audiotape system that reconfigures the magnetic tape information into video pictures or sound.

### **Plotter**

A device commonly used by engineers and architects (where precision is crucial) that uses one or more colored pens that can be raised, lowered and moved over the printing media (usually paper) to draw graphics or text. Plotters can produce smooth, continuous lines, whereas standard printers can only print dots very close together to simulate lines.

**Plug 'n Play - Polarity****Plug 'n Play®**

Plug 'n Play is a term referring to software and peripherals systems now being designed to be easily installed by users. Computers have progressed toward higher levels of user friendliness with plug 'n play protocols. These protocols are intended to assist computer systems quickly identify the kind of peripheral a user is attaching, and also what technical standards are used with a particular vendor's equipment.

**Plug-In**

Sometimes called a "helper application," a plug-in is used to provide additional instructions to a parent application. For example, a Web browser such as Netscape Navigator or Internet Explorer commonly uses plug-ins such as Shockwave, Flash, RealAudio, RealVideo, Acrobat, and others to display content created for those plug-ins. Plug-ins can usually be downloaded for free. (See Acrobat, Browser, Flash, Portable Document Format)

**PM - Phase Modulation**

A type of signal modulation process where the phase of a sine wave (carrier wave) is shifted in phase to represent a change in the value of the information.

**PNG - Portable Network Graphics**

Pronounced "ping," refers to a patent-free image format that is becoming more and more widely used to display graphics on the Web. PNG is widely considered to be a potential replacement for the widely popular GIF image format. The most recent versions of Netscape Navigator and Microsoft Internet Explorer now support PNG. (See GIF)

**Point-to-Multipoint**

Refers to any transmission mode that is distributed from one main source to many points within a broad geographic area. Broadcast audio, video and new datacasting services, as well as DBS satellite services, are examples of point-to-multipoint services. (See Point-to-Point)

**Point-to-Point**

Refers to any transmission mode or delivery system that distributes a signal from one specific source to another specific receiving end-point. Telephone calls are point-to-point communications.

**Point-To-Point Protocol (PPP)**

A transmission standard for computing systems that enables delivery of Internet data in the standard TCP/IP format using a digital telephone modem. PPP is an updated version of Serial Line Internet Protocol. (See Internet, SLIP, TCP/IP)

**Polarity**

1. Refers to the direction in which an electric current flows; polarity is either positive or negative.
2. Antennas can create signals that are best received with other antennas that have the same polarity vector. Typical designations are Horizontal, Vertical, and Circular (right and left). These designations are based on vector mathematics, but unless one is designing antennas, the point is that the transmitting and receive antennas should always have the same polarity.
3. Polarity also is used to describe one relationship between light and dark areas in a television signal. Polarity is stated as black negative or black positive.

### Polarization

A technical characteristic of a wave when transmitted or radiated from an antenna. Types of polarization include horizontal, vertical, and two versions of circular (left and right). Polarization is used to describe a characteristic of terrestrial transmission antennas, and satellite transponder antennas.

### Polar Orbit

A type of communication satellite orbit that is designed specifically to cover the polar regions of the earth as opposed to other orbits. (See Elliptical Orbit)

### POP – Point-of-Presence

Refers to any location where a service provider has a physical connection point for local subscribers to attach or dial into a network.

### POPS – Populations

A wireless industry slang term used to convey the potential customer base in a given service area. Instead of saying potential “customers” or potential subscribers many cellular companies describe the user base in terms of “POPS.” For example, ABC Cellular has 1 million pops already signed up and is looking for total pops of 10 million in 10 years.

### Port

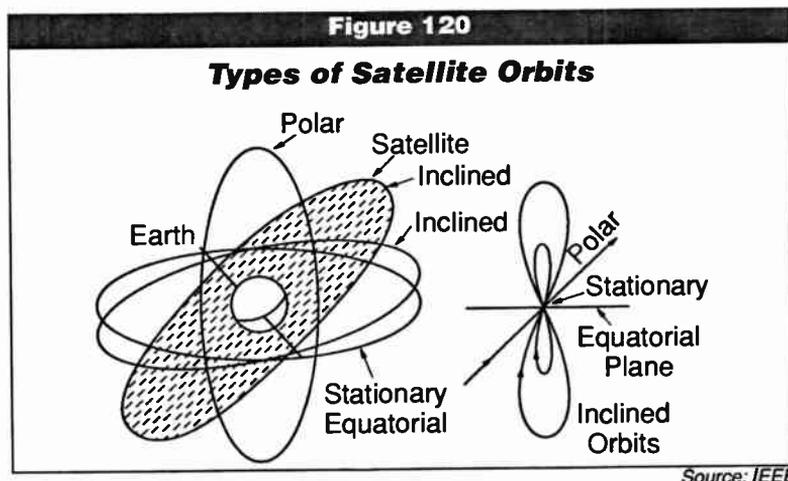
In computer/electronics domains, a port is any interface or input connector point on a computer or other electronic communications device where peripheral or ancillary equipment can be linked or attached. Also, the point of access into a network, computer or other electronic device such as a plug or jack for attaching telecommunications connections or other peripheral equipment.

### Port Replicator

Similar in use to a docking station, a port replicator makes it easy for mobile computer users to connect peripheral devices such as a printer and a monitor to their laptop. For example, users who work in two different office locations could connect a printer, monitor, and an external hard drive to a port replicator in each location. Then, when they show up for work all they have to do is connect the port replicator to the back of their laptop – they are then instantly connected to all of their peripheral devices at once. Port replicators differ from a docking station because they don't usually provide as many expansion slots for additional devices. (See Docking Station)

### Portable Document Format™ (PDF)

The file format for Adobe Systems' Acrobat software, PDF represents documents in a manner that is independent of the original application software, hardware, and operating system used to create those documents. A PDF document can contain any combination of text, graphics, and images in a device-independent and resolution-independent format. These documents can be one



**Post - Printer**

page or thousands of pages, very simple or extremely complex with a rich use of fonts, graphics, color and images. PDF is a popular format for distributing precisely formatted text documents via the Internet. (See Acrobat, Cross Platform, Plug-in)

**Post**

To send a message by e-mail to one or more recipients. Messages are posted to bulletin boards to be received by anyone interested in that specified topic. (See Bulletin Board, E-Mail)

**Post House**

A post production firm usually hired to edit already shot video or films footage into a finished product. The common video industry maxim "Fix it in Post" comes into play because poorly shot film can be enhanced or altered with graphics, computer animation, color correction, editing, or many other post house techniques.

**Post-Production**

A term referring to the period in the production process after the film, video, or audio has been recorded but requires polishing, editing, etc., to create a finished product.

**POTS - Plain Old Telephone Service**

Standard residential telephone service providing regular dial-tone service.

**PPP**

(See Point-to-Point Protocol)

**PPV - Pay-Per-View**

A type of pay television service that charges for each programming event offered to cable DBS, MMDS or other multichannel video subscriber. PPV services usually are made available in addressable pay-TV systems where individual customers can decide to order a specific event such as a boxing card, or special music concert. PPV services are unlike other subscription services, which are provided under a flat monthly rate.

**Pre-Production**

Refers to the background research, development, and set-up time that occur prior to any actual recording of film, video, or audio material.

**Presentation Layer**

(See OSI)

**PRI - Primary Rate Interface**

A type of high-speed ISDN telecommunication service that provides 23 "bearer" channels, each transmitting at 64 kbps, and one separate data channel transmitting at 16 kbps. PRI systems have much more bandwidth availability than the ISDN Basic Rate Interface facilities. (See BRI, ISDN)

**Printer**

A computer peripheral device usually connected to a computer to create hard copies of text or graphics or other spreadsheet or database files. The quality of printers has increased dramatically from dot matrix printers, where text was inked onto a page with tiny dot-like markings. More common today are bubble jet and laser printers that perform at much higher per page rates with substantially higher image quality.

**Private Network**

Refers to any type of voice or data network designed for inter-office business communications. Outside parties cannot access the network and set up is the concern of the individual company, not the local telephone company. (See Virtual Private Network)

**Privatization**

Refers to the shift of national industrial, communications, or other economic businesses from state-run control to the private sector. Transferring public agencies or industries previously under the control of government authority and removing the protective structural supports by making the industry a fully commercial enterprise. De-nationalizing or deregulating an industry, business or organization by making a transition from the public to the private sector, and thus making the business subject to competitive market forces. The privatizing of national industries may be accompanied by offering the public the opportunity to buy shares in the new business or company via an initial public offering (IPO).

**PRN - Pseudo-Random Noise**

A type of communication signal interference, or noise, which seems to follow no particular pattern thus at first, appears to be random. But the particular noise pattern eventually does repeat itself after a length of time and is therefore considered pseudo-random noise.

**Processor**

The central intelligence of a computer dedicated to handling information. The central processor is responsible for reading and writing data and instructions. It contains the control unit, the arithmetic and logic unit, as well as the clock responsible for timing functions within the computer. Interrupt signals are sent to the processor to allow initiation of tasks or functions. (See CPU)

**Program**

Programs exist in both analog and digital forms. An example of an analog program is a television show. An example of a digital program is a set of instructions given to the CPU of a computer or an automated telephone system to perform certain tasks or functions. Whether in analog or digital form, programs can be stored on magnetic devices such as tape or discs or in the case of audio or video programs, can be converted to digital and stored for archiving, later editing, or reused as clips or materials in other programs, among other applications.

**Progressive Scanning**

A type of video scanning most commonly associated with computer monitors at present. Progressive scanning is where an entire frame of video information is displayed by progressively sweeping a beam across every video line from top to bottom. Modern PC monitors support scanning rates at 60, 65, and 70 frames per second, with 75 and 85 frames per second used for monitors with higher than standard resolution such as CAD monitors.

**PROM - Programmable Read-Only Memory**

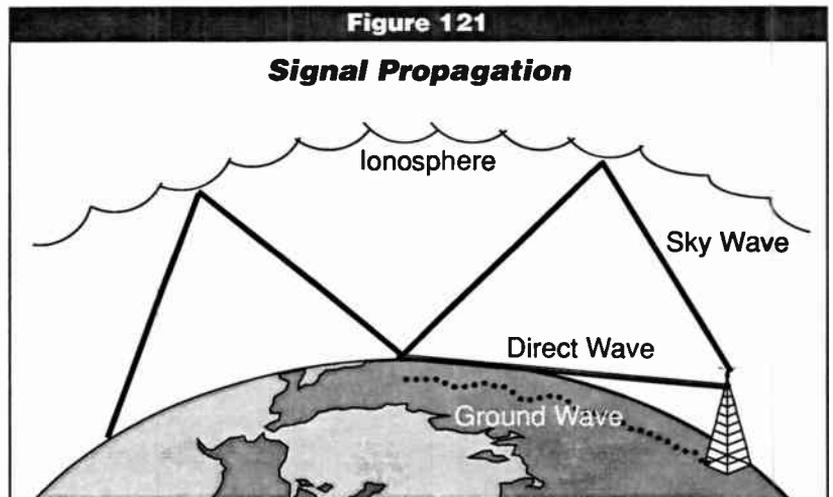
A type of computer system memory storage system which allows changes to be made without having to create or install a new read-only memory (ROM) capacity, which is basically designed as permanent memory used only for accessing and not able to be reprogrammed or altered. PROM allows for some reprogramming but differs from RAM in that it retains the installed information while RAM is erased when the system is shut off.

**Propagation - Proxy Server**

**Propagation**

To disseminate or spread electromagnetic signals over or through a medium. For example, radio waves are propagated over-the-air, and can be propagated through water. The non-ionizing radiation of signal waves outward from an antenna is referred to as propagation. Theoretically, radio energy radiates out from an antenna uni-

formly in all directions forming an omnidirectional coverage pattern. In practice, however, refraction (bending), reflection (bouncing), absorption, and interference will impact the distance and direction of a radio wave. There are three basic wave types: direct waves, ground waves, and sky waves. Waves at certain frequencies travel in a straight line to the horizon and then are reflected off into space; others tend to travel along the curvature of the earth, while still others propagate into space only to be bounced off the ionosphere and returned to earth. All of these characteristics can be advantages, or disadvantages that can be managed to some degree by good engineering.



Source: NAB

**Protocols**

A protocol is a set of formal rules used to handle the communication of data between different types of computers. Protocols are also used to deliver different types of computer services some of the most widely used protocols are shown in the accompanying table. (See IP)

**Proxy Server**

Usually a World Wide Web server that accepts requests in the place of a primary server. Proxy servers typically run on a secure internal machine, providing access to the outside world for people inside the security barrier (firewall). Proxy servers are also used to speed up the transmission of information on the Web by storing the most frequently requested content

Table 37

**Common Internet Communications Protocols**

Internet Protocol	Description
TCP/IP	<i>Transmission Control Protocol/Internet Protocol</i> – the standardized technical format used for Internet systems, services, applications, etc.
SMTP	<i>Simple Mail Transfer Protocol</i> – used to transmit email across the Internet
HTTP	<i>Hypertext Transfer Protocol</i> – used to transmit web pages across the Internet
FTP	<i>File Transfer Protocol</i> – used to transfer computer files across the Internet
NNTP	<i>Network News Transfer Protocol</i> – used to send and distributed postings to Internet newsgroups (a.k.a. Usenet)

in an easy-to-access location and delivering it quickly without a lengthy search and access process. (See Cache, Mirror)

**PSC – Public Service Commission**

PSCs, also known as Public Utilities Commission (PUCs), are established in every state to oversee state-authorized utility rates, tariff, service rules and regulations affecting operations within the jurisdiction of a state. Contact individual state PSCs or PUCs for relevant information.

**PSK – Phase Shift Keying**

This is a type of signal modulation where a change or shift is made in the phase of a wave signal. Essentially, when the wave represented as a sine wave is shifted so it is at a peak point instead of a trough, it is considered to be 180 degrees out of phase. PSK systems allow changes in the phase of a signal to represent when a digital bit should be a one or zero. A phase shift of 180 degrees, or lack of this shift, indicates to a digital PSK receiver whether the data bit is a “1” (on) or “0” (off).

**PSPDN – Packet Switched Public Data Network**

Packet switched public data network dedicated to an X.25 system. (See Public Network, X.25)

**PSTN – Public Switched Telephone Network**

Refers to the standard public telephone network available to anyone wanting to subscribe. The difference between public and private switched networks is in the configuration of the services. Private services are provided to businesses or preferred customers and include special dialing options, but these services are conveyed over the standard telephone system. (See VPN)

**Public Domain**

Works of authorship or inventions that can be used by the public without the consent of the author or inventor. Generally, this applies when the term of protection has expired, or the creator failed to comply with the formalities necessary to obtain protection of the work. Pertains to body(ies) of work no longer under copyright. For example, musical compositions come into the public domain after an artist has been dead for over fifty years.

**Public Network**

Any voice, data, or other related telecommunications network operating for public use such as the nation's Public Switched Telephone Network (PSTN) that includes local and long-distance telephone and data networks available to residential homes and in public locations.

**Public-Key Cryptography**

Refers to the revolutionary system of securing information on computer networks that uses a “private key” to encrypt a digital message and then uses a “public key” to decrypt the message. Each person's public key is published while the private key is kept secret. Messages are encrypted using the intended recipient's public key and can only be decrypted using that person's private key. One of the most popular forms of public-key cryptography is Phil Zimmerman's “Pretty Good Privacy” (PGP), which is an encryption system so strong that it was initially considered (and was regulated) under the munitions category. (See Clipper Chip, PKI)

**PUC – Public Utilities Commission**

A state regulatory body that oversees telecommunication laws as they apply within the individual state jurisdiction. State PUC authority may include local telephone companies, cellular and cable services, and any other communications media that are confined within the boundaries of the state. Once a service becomes interstate, regulatory responsibility moves to the federal level and the FCC.

**Pulse Amplitude Modulation - PWM****Pulse Amplitude Modulation**

(See PAM)

**Pulse Code Modulation**

(See PCM)

**Pulse Width Modulation**

(See PWM)

**Push Technology**

Refers to a media distribution model where content is sent to users (i.e., viewers, listeners, online users, etc.) in a set sequence transmitted by a server system or other media distribution source. Push technology or push media contrasts with "pull technology" where a user must request each specific item individually. One of the first successful implementers of Internet push technology was PointCast, which delivered news, information, and advertisements to online users and was displayed automatically much like a screen saver program.

**PVC - Permanent Virtual Circuit**

A pathway for data or phone service that is permanently set up for communication between two parties. It is virtual in the respect that it is not a direct line from one place to the other and was not intended for that specific purpose. (See Virtual Circuit)

**PWM - Pulse Width Modulation**

Another form of digital signal modulation whereby after a wave has been digitally sampled, the variations in the samples are coded into established signal widths in the transmitted carrier wave. This method is not used very often. (See PAM, PCM)

**QA - Quality Assurance**

Systematic procedures in production or manufacturing to ensure standardization of product quality to meet or exceed pre-established targets or standards.

**QAM - Quadrature Amplitude Modulation**

A sophisticated modulation scheme that uses variations in signal amplitude and phase of a carrier to produce different states of data encoded symbols. An example of QAM is a modem that operates at high speeds.

**QoS (Quality of Service)**

Refers to the goal of providing network services (especially bandwidth) in a dependable and predictable way.

**QPSK - Quaternary Phase-Shift Keying**

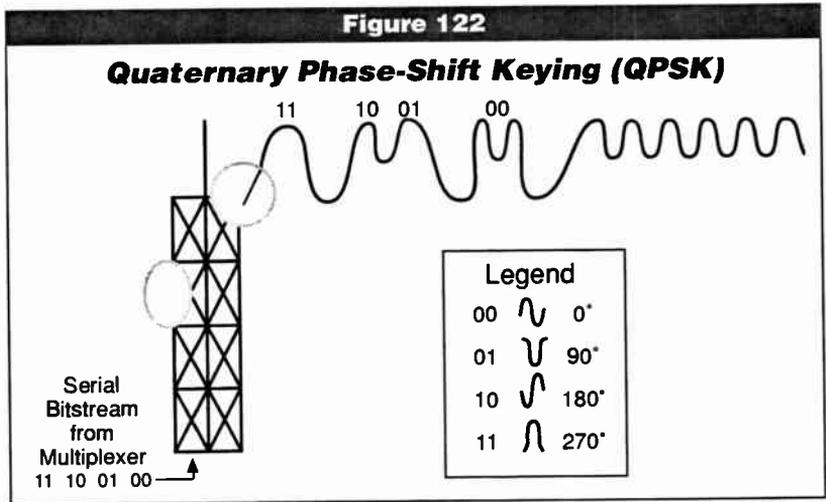
Another way of sending data through a modem over an analog phone line.

**Quality**

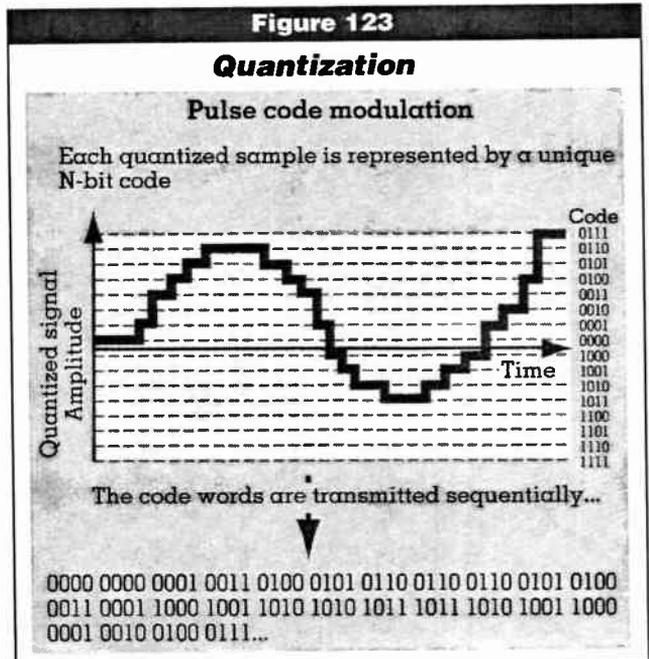
Degree or grade of excellence usually defined in terms of performance and the ability to meet certain standards. In communications systems, quality usually applies to technical performance and/or the ability of equipment, systems, software, networks, or systems to achieve or meet stated levels of performance quality.

**Quantization**

Refers to the process of taking discrete digital samplings of analog signals and quantizing these samples into numerical quantities that can be converted to binary digital form. If an error occurs while a sample is being quantized, when the signal is reconverted back from digital to analog, it will appear as interference or distortion in the signal. An example of this distortion is a hissing noise heard in phone conversations, which indicates the signal was not properly quantized. Analog signals including audio voice and music, and



Source: Wireless Networked Communications



Source: CED Magazine, April 1996

**Queuing - QWERTY Keyboard**

video are quantized using some encoding scheme when being converted to digital form. The amount of sampling (i.e., sampling frequency) determines how faithful to the original the signal will be when decoded and restored back into analog form. (See Sampling, Sampling Frequency)

**Queuing**

A management process for handling information in an organized, methodical fashion. In computer systems, queuing is the act of stacking instructions, tasks, or jobs so that whenever resources or devices become available; information can be processed in a sequential order. Some systems have the ability to prioritize queue entries to process higher order tasks sooner. Queuing systems run on FIFO principles, with earliest entries processed first. (See FIFO)

**Quicktime™**

A multimedia development, storage, and playback technology developed by Apple that integrates video, animation and audio into a compressed format that is easy to include in other documents. Quicktime is a popular format for distributing short videos (1-10 minutes) via the Internet. Viewing a Quicktime file via a Web browser requires a Quicktime player that can be downloaded for free. (See Plug-in)

**QWERTY Keyboard**

Pronounced "kwer-tee," this keyboard is the de facto standard for English language typed text. The design layout was developed in the 1860s and used for computer keyboards today. (See Dvorak)



## Radio

Refers to a system of radio broadcasting which, in the U.S., is provided free over-the-air by over 10,504 commercial AM and FM radio stations, and complemented by 2,040 public radio stations. In the U.S., radio reaches 95.4% of persons ages 12+ every week, car radio 81.2% of adults 18 years and older, every week, and radio reaches 75.2% of persons 12+ every day.

## Radio Broadcast Data System

(See RBDS)

## RAID - Redundant Array of Independent Drives

A computer storage device containing several hard disk drives in a single housing offering redundant data protection in the event of hardware failure. RAID systems provide high-speed disk access and some error detection and correction capabilities. Data can be stored simultaneously on more than one disk drive providing system redundancy. Five levels of security protection are available in RAID systems, with capabilities to recover from almost any realistic failure scenario.

## RAM - Random Access Memory

The primary memory capacity in a computer and used only for temporary storage. RAM has read/write capabilities and requires a constant power supply thus power surges or other interruptions require the installation of backup protection procedures. Once a computer is turned off or shut down, for any reason, any information in RAM is lost. To prevent loss problems, information of high value (i.e., cannot be replaced easily) should be saved permanently on a hard disk, floppy disk, and/or on some other more permanent storage mediums.

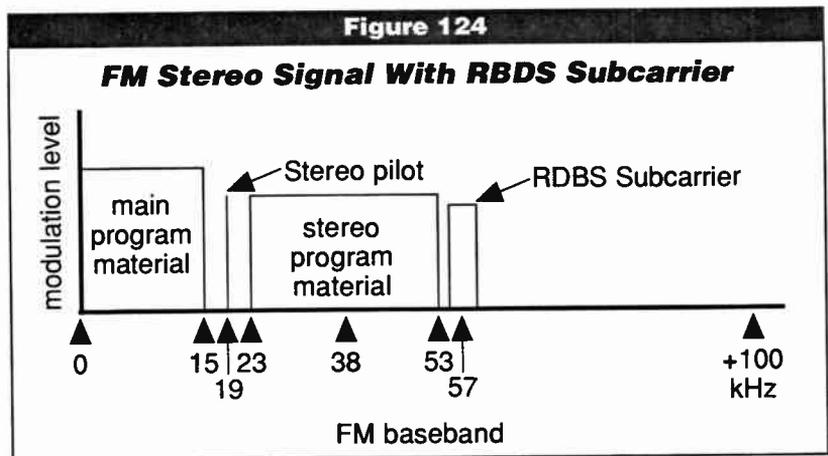
## Rate

A measurement of quantity with respect to some other fixed quantity, typically a fixed amount of time. (See Bit Rate, Field Frequency)

## RBDS - Radio Broadcast Data System

U.S. radio industry technical standard for transmitting a range of digital information and data to "smart" radio receivers using existing FM station subcarriers centered at 57 kHz and 92 kHz. RBDS receivers have features including emergency alert messaging, tuning of stations by format, and digital

LEDs that can display station logos, call signs, song titles, artist names or other station-generated text. "Smart-Radio" components also can be hooked up directly to home PCs for reception of stereo radio and a variety of text and other data from local radio stations. (See RDS, Subcarrier)

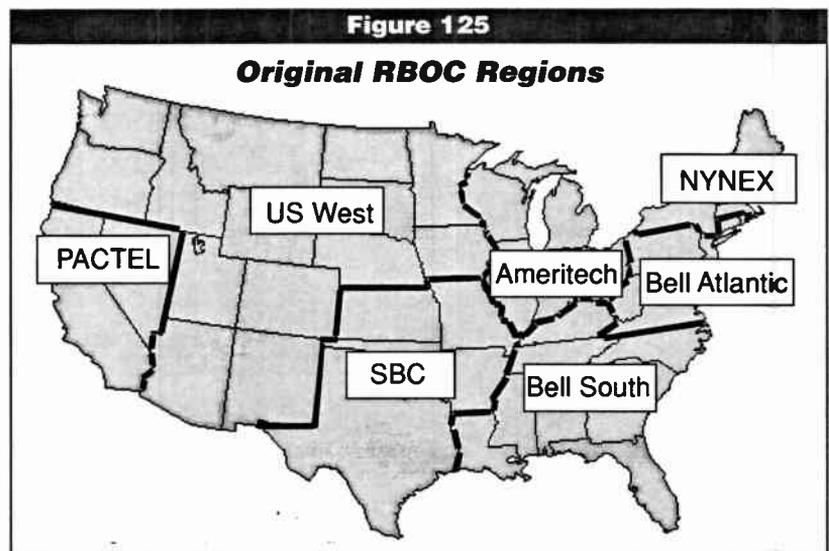


Source: NAB

**RBOC - Real Time****RBOC - Regional Bell Operating Company**

The seven regional telephone companies originally created as a result of the divestiture of AT&T in 1984. Known as the "Baby Bells," the RBOCs provided local telephone services through their combined 22 Local Exchange Carrier (LEC) subsidiaries. Passage of the landmark 1996 Telecommunications Act, significantly broadened the scope and

business markets the RBOCs were eligible to enter including local and long-distance service (pending specific FCC approval), equipment manufacturing, and broadband video. Mergers and buyouts have reduced the number of former Baby Bells from seven to four – Bell Atlantic (merged with Nynex, and also is acquiring major independent GTE), BellSouth, SBC (merged/acquired Pacific Telesis, Ameritech), and Quest (acquired U.S. West). Further mergers and acquisitions remain possible.



Source: Industry

**RCA Connector**

Refers to a standardized plug on the end of cables and corresponding standardized sockets on electronic equipment for connecting audio and video components.

**R-DAT - Rotating-Head Digital Audio Recorder**

Professional-quality digital audio tape recorder system. (See DAT)

**RDS - Radio Data System**

European-developed RF data system for incorporating data transmission signals on FM radio subcarriers. The technical standard for RDS receivers became a foundation for development of the U.S. RBDS system. (See RBDS)

**Read-Only**

A computer file that has been "locked" by its creator or an authorized party, so that the information in the file can be accessed and read by any number of computer users, but the contents of the file cannot be changed or manipulated in any way by unauthorized users.

**RealNetworks**

(See Streaming Media)

**Real Time**

Used in reference to telephone and video signals, usually this means a system where there is no perceived delay in the transmission and/or reception of a signal. Phone conversations are in real time, as are live news broadcasts.

**Reboot**

Computer slang meaning to turn on the system or to re-set the computer (e.g., re-set the internal pointers, counters, clear out instructions, etc.). A “cold boot” refers to restarting a computer that has been turned off. A “warm boot” or boot-up means restarting a computer without physically turning off the electricity, but by hitting “Ctrl-Alt-Del” keys. Such rebooting may be necessary when the system freezes for unknown reasons or experiences a general protection fault (GPF) for undetermined reasons. (See Warm Boot)

**Receiver**

A receiver is any electronic device that accepts a transmission signal and is opposite of a transmitter. Some devices perform both functions and are referred to as transceivers. Electronic receivers can range from small hand-held PCS or cellular flip-phones to massive radioastronomy satellite dishes.

**Record Head**

An electromagnetic device that magnetizes the surface of a tape or disc in the process of recording an analog or digital signal.

**Redundancy**

Refers especially to digital encoding procedures which identify parts of a analog voice, audio music, or video signal that can be eliminated without losing critical or important information that is contained in the signal. Redundant parts of a signal usually are those that are precisely repetitive of signal parts that already were encoded in a prior digital data frame. Although redundant material is left out or eliminated in compression schemes aimed at saving transmission time or storage space, quite often the original signal is restored as faithfully as possible through expanding or filling in the missing parts through interpolation techniques for actual viewing or listening. (See Companding, Compression)

**Re-engineering**

Refers to activities where a system, piece of equipment, product manufacturing process, or even software is redesigned with the intent of improving quality, adding functions or features, increasing productivity, speed or efficiency.

**Register**

Minor specialized storage capacity within a microprocessor used for temporary retention of information bits to be processed by the computer.

**Registry**

Refers to the main collection of configuration information on a computer running the Windows operating system. Settings such as user preferences, unique user configurations, hardware and software settings, configurations for peripherals such as monitors and printers, and a wide variety of other information are stored in the registry. Many technical support specialists consider the Windows Registry to be a very powerful and convenient way to control the operations of the machine. However, it can also be something of an Achilles heel – if errors are made in the registry, or if the registry becomes corrupted, the entire machine can be disabled. (See Windows)

**Relational Database**

A data storage and retrieval system specifically designed to increase the effective utility of stored data by enabling examinations of the relationships among pieces of information. A relational database management system stores information in the form of tables and then links or “relates”

## Relay - Repeater

those tables to one another in order to provide answers to database “queries.” Relational database systems were first conceived in the early 1970s, but were not implemented until the mid-1980s when technology advances made the concept practicable. (See Data Mining, Data Warehousing)

### Relay

In general, a device that enables input power to control a local source of power. It can be an electronic device or switch that closes electromagnetic contacts allowing one or more circuits to be completed. A relay is typically used to isolate high power or voltage from electrical control circuits.

### Remote Sensing

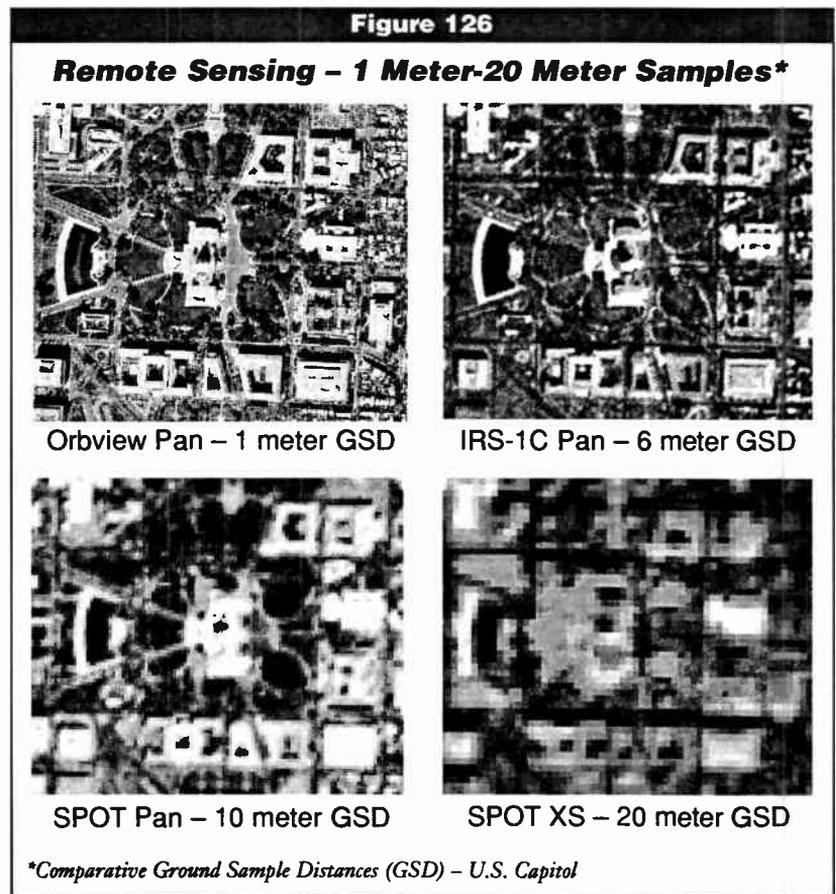
In simple terms, remote sensing is the process of using sophisticated sensors and related instruments onboard satellites and aircraft to detect and record ground-based geographical data. The launch of high-resolution commercial imaging satellites in the 1990s, which previously had been prohibited by governments (particularly U.S.) for national security reasons, has driven the expansion of the remote sensing industry. U.S. government licensing now allows the commercial market to launch high-resolution, multi-spectral imaging satellites with detection capacities down from the once standard 30-

meter level to 1-meter or less. Remote sensing applications include agricultural/ environmental analyses (soil, vegetation, irrigation, moisture differentiations,) disaster assessments (flooding, oil on water discriminations, fire (heat), smoke penetrations), geological mapping, shoreline discriminations, city planning (mapping with virtual images of major construction projects inserted), and newsgathering information from world conflict zones, among others. (See GIS, Thermal Mapping)

### Repeater

An electronic device or system used to amplify signals so that losses in quality and strength over long distances are less likely to impair the reception of an acceptable quality signal. Repeaters can be used in both analog and digital transmission systems and used in microwave, broadcast, cable television and many other communication distribution networks.

**NAB**



Source: OrbView, Space Imaging, Inc, and ©CNES/SPOT Image

**Repetitive Strain Syndrome (RSI)**

A condition experienced by a growing number of people who engage in the repetitive physical movements that cause trauma to soft tissue and nerves. Thousands of computer users now suffer from RSI conditions such as carpal tunnel syndrome in the wrists because of excessive use of the keyboard and mouse. (See Ergonomics)

**Replication**

Creating and maintaining a duplicate copy of a database or file system on a different computer, typically a server. The term usually implies the intelligent copying of parts of the source database that have changed since the last replication with the destination. Replication allows many users to work on their own local copy of a database, and then their individual changes are later reconciled with any changes that anyone else made to the parts of the database they were working on from their own computers. (See Archive, Data Warehousing, Incremental Backup)

**Resistor**

A component used in a circuit that provides intended impedance or opposition to the flow of an electrical current. Measured in Ohms, the amount of resistance is dependent upon the design of the resistor that can be color coded to indicate the amount of resistance in the device. Resistors are one of the essential building blocks needed to make electronic circuits work as they regulate and manage electrical power supply to fragile component parts or highly sensitive systems such as computer networks.

**Resolution**

In television and other video display systems such as television sets or computer monitors, the quality of picture resolution is a function of the relative amount of video material in a signal and the size and/or number of pixels used in a particular television set or computer monitor. Video resolution is often stated as the number of horizontal (H) times the number of vertical (V) pixels available for display. For example, the resolution in the NTSC television broadcasting system is 330H x 343V; digital HDTV broadcasts will have a resolution that is approximately twice that of NTSC in both horizontal and vertical dimensions.

**Retransmission Consent**

The requirement that cable operators, satellite carriers, and other multichannel video program distributors obtain permission to retransmit the signals of television and radio stations. Local broadcasters have two options for signal carriage by cable systems and satellite carriers: (1) they may negotiate a retransmission consent agreement with a cable operator or satellite carrier or (2) they may elect to be carried under must-carry provisions. (See Must-Carry)

**Retrieval Engine**

A cyberspace-related term for a software program designed for the specific function of retrieving or finding Internet files or data. (See Search Engine)

**RF Spectrum - Radio Frequency Spectrum**

A portion of the electromagnetic frequency spectrum useful for communication purposes generally considered to range from 3 kHz and 300 GHz.

**RFC - Request for Comment**

The contents of an RFC may range from standards to specifications to research results or proposals to potential governmental regulations.

**RFI - RISC****RFI - Radio Frequency Interference**

RFI is any energy that intrudes and distorts the intended processing of a signal. This interfering energy can be from any electrical or electronic device that causes changes in a current flow and range from ordinary light switches to complex computers. RFI can be a result of defective high voltage power line equipment due to leakage arcs across the insulators or other structures. RFI is particularly troublesome in computer environments and the FCC has established classes for types of computers. Office computers have to meet Class A requirements for frequency leakage which is higher than for Class B computers, such as those sold for home use.

**RFR - Radio Frequency Radiation**

Non-ionizing electromagnetic energy. (See NIER, RF)

**RGB - Red, Green, Blue**

Represents the primary colors used as the standard in NTSC broadcast video. All variations of colors displayed on TV screens are based on values of red, green, and blue. Typically, three electron guns with one devoted to each color are installed inside television sets or monitors to produce broadcast television pictures.

	Red	Green	Blue
Black	Off	Off	Off
Blue	Off	Off	On
Red	On	Off	Off
Magenta	On	Off	On
Green	Off	On	Off
Cyan	Off	On	On
Yellow	On	On	Off
White	On	On	On

Source: NAB

**Rich Text Format (RTF)**

A document format from Microsoft designed to facilitate the exchange of documents between Word and other document preparation programs. For example, in some cases it might be necessary to save a Microsoft Word document in RTF so that it can be loaded into another software program.

**Ring Network**

(See Token Ring)

**RISC - Reduced Instruction Set Computing**

A new type of hardware/software interface system being developed for use in high-end computer systems to increase throughput data rates and to effectively handle the huge amount of instructions being sent to and from PC central processors. Larger, more complex sets of computing instructions have been added along with succeeding generations of microprocessors. These instructions, called microcode, are used to initiate all the internal tasks needed to perform computer operations. RISC microcomputer chips were developed to optimize execution speeds of smaller sets of instructions, resulting in a reduced instruction set for commands. In turn this reduces the time to move selected commands from storage to be activated. Along with other streamline RISC produces increased processing speeds compared to complex instruction sets microcomputers run at the same clock speed and bus architecture.

**RJ - Registered Jacks**

Signifies a set of electronic connector specifications set by the FCC as industry standards.

- RJ - 11: A 6-wire conductor that is a standard telephone jack. Two wires are used each for sending, receiving, and signaling.
- RJ - 45: An 8-wire conductor that is a standard data jack which looks like a standard telephone jack only slightly larger.

**Roaming**

Operation of a wireless communications device outside a customer's primary location of operation. Wireless units operating as roamers include cellular or PCS phones, messaging devices, data receivers, and more recently equipment such as a laptop computer equipped with built-in receivers for wireless Internet access. By operating out of a customer's designated local area, customers often must pay special roaming charges. New mobile satellite systems with continental footprints as coverage areas will seek to exploit this as an advantage for switching to their digital mobile data/phone services.

**Round Robin DNS**

Refers to a method of managing Internet server congestion by simultaneously spreading connection loads across multiple servers that contain identical content. For example, if a company has one domain name and ten identical home pages on ten separate servers, when several users from different locations attempt to access the home page at the same time, their requests are directed toward an available server on a rigid rotating basis. Specifically, the first user is directed toward the first server, the seventh user to the seventh server, and the eleventh user would be directed back to the first server. (See Domain Name, Internet, Web Hosting)

**Router**

An electronic device designed to direct digital communication data packet to desired destinations. Routers are generally component parts of electronic telecom and computer networks. Routers may be a form of a technical bridge to assist in connecting local area networks that operate under different technical protocols or standards; a device combining functions of a bridge with a router are called brouters.

**Routing**

A term used in data and phone networks that refers to determining a signal pathway and directing information (voice or data) through that path.

**ROM - Read Only Memory**

In computers, read only memory is storage capacity that can be read but not written on, altered or deleted. ROM typically contains the fundamental software necessary to control the microprocessor enabling the operating system to be loaded. ROM is also used to control special purpose processors in the computer. (See CD-ROM, RAM)

**RS-232**

A common computer environment technical standard established by the Electronic Industries Association for serial data interface connections between various equipment.

## S-Band - Sampling

# S

### S-Band

An upper part of the electromagnetic radio spectrum from 2310 to 2360 MHz. A portion of the band was allocated by the FCC for U.S. satellite digital audio services (SDARS), and complementary terrestrial digital audio services. (See SDARS)

### S-VHS - Super VHS

An upgraded version of VHS format videotape that utilizes a greater amount of video signal bandwidth to increase the amount of information able to be stored on the tape. Developed by JVC, the greater bandwidth available on S-VHS tapes produces better image resolution. S-VHS approaches broadcast quality with a possible resolution of about 400 video scan lines (NTSC TV has 483 active video lines) compared to VHS format of only about 230 lines of resolution. VHS tape players cannot play S-VHS tapes although S-VHS decks are backward compatible to accommodate VHS format tapes.

### S-Video

On computer equipment or a video monitor there can be an S-Video input that provides a plug interface for an S-VHS videotape player. S-VHS offers over 400 scan lines of horizontal resolution in comparison to the 230 lines offered with standard VHS. S-Video is sometimes referred to as Y/C video because it separates the luminance (Y) and chrominance (C) information into separate video outputs. This process eliminates some color distortion when the signal is scanned, and provides higher resolution.

### S/N - Signal to Noise Ratio

A measure of the amount of "noise" in a distribution line or transmitted signal compared to the strength of the intended signal. The ratio (also often represented as SNR) is derived by dividing the signal level by the amount of interference or noise in the system, and is usually expressed in decibels (dB). If the S/N ratio is negative, very likely a signal cannot be retrieved or extracted from the surrounding noise except by using very sophisticated communications systems such as spread spectrum. (See Interference)

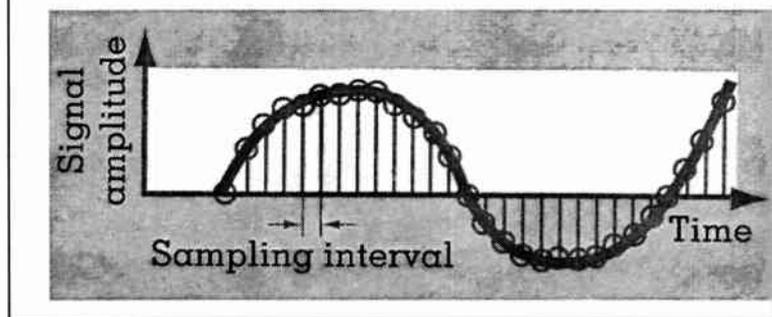
### Sampling

In digital communications fields, sampling is a critical part of the process for converting analog signals to digital. Sampling refers to the process of obtaining or taking small discrete samples of an analog signal, such as an audio recording, at a mathematically determined rate which will allow the

digital signal to be faithfully reproduced when it is converted back to analog for listening. CDs are digital recordings that have been sampled at a very high rate to ensure faithful reproduction for listeners. There has to be some finite number of samples taken of the analog signal because representing every instant of sound is not feasible. But, if an analog signal at the end of the conversion process is to represent the original at all, a mathematical law comes into play. The amount of times a signal needs to be sampled (i.e., the sampling frequency) *must* be at least twice

Figure 127

### Sampling



Source: CED Magazine, April 1996

the highest sound frequency in the original signal. Another part of the sampling process is to compare the samples to an established numerical scale representing the range of sound frequencies. Again, not every instant of sound can be represented, so the samples are quantified (or said to be quantized) to the nearest numerical value. (See Nyquist Frequency, Quantization)

### **Sampling Frequency**

The rate at which analog signals are sampled (within a specific time period) when converting a signal into a digital format. To achieve an accurate, faithful reproduction of an audio or video signal after converting a digital signal back to analog for listening or viewing, there is a technical minimum rate at which an analog signal must be sampled. This minimum sampling rate or sampling frequency is determined by mathematical formula set forth in Nyquist Sampling. (See Nyquist Frequency)

### **SAP**

1. *Secondary Audio Program* – An auxiliary secondary audio program channel incorporated into the existing NTSC television signal as part of the BTSC Multichannel Television Sound (MTS) system. The SAP channel is a narrowband channel that can be used for transmitting a second audio language track or other type of audio service such as a reading service for the visually impaired. The availability of SAP and related PRO channel capacity could enable TV stations to provide high-speed digital data broadcasting services including wireless services, such as electronic mail, paging, interactive television and other consumer and business services. (See Datacasting, Data Broadcasting)
2. *Service Access Point* – The point in a network where a user can access any services provided by the network.
3. *Systems, Applications and Products* – An acronym for Systems, Applications and Products typically specialized software designed to make business practices more efficient by optimizing supply chains, managing strategic relationships, reducing time to market, sharing virtual information, etc. SAP solutions are widely used in very large corporations to coordinate their computing infrastructure, including companies such as Volvo, Dell Computer Corp., Volkswagen, Dow Corning, Inc., and Eastman Kodak. (See Client/Server, E-Commerce, ERP)

### **Sat Phones**

A shorthand reference to the emerging market of small hand-held satellite telephones. Typically about the size of a small laptop computer (with attached handset), satellite phones enable mobile users to connect to telephone networks when out of the range of traditional mobile telephone service areas. Use is intended for transmitting voice, data, and fax communications, or when the traditional telephone network is not functioning. Satellite phone service offered by companies such as Iridium, MSAT, and Inmarsat, covers approximately 98 percent of the globe, and thus is ideal for use in remote rural areas, on boats, or in other locations not served by wireless networks.

### **Satellite**

Generally, a satellite is any object in relatively permanent orbit around a planet or other celestial body. In earth-based communications, orbiting satellites are complex electronic systems for receiving and transmitting radio frequency signals for a vast range of applications or services. In addition to transmitting traditional domestic and international voice, video, and data traffic, satellites are used to gather information such as a weather data, remote sensing images, surveillance data, and also can act as an orbiting tracking and data relay station (TDRSS) for other satellites.

**Saturation - Scanning****Saturation**

1. In video color schemes, saturation refers to the percentage of white in any particular color. A saturation of 100%, regardless of the color, would equal "true white."
2. In communication market business usage, saturation refers to market penetration and/or adoption rate of a product, service, concept, or idea that can be effectuated through promotion and marketing saturation campaigns.

**SCA - Subsidiary Communications Authorization**

SCAs originally were authorizations granted by the FCC to FM radio stations in order to use a station's FM subcarrier(s) for transmitting a variety of commercial services such as Muzak audio services. The FCC deregulated subcarrier services in the 1980s, but the SCA moniker still lingers as a shorthand reference to radio subcarrier services. FM subcarriers are part of an FM baseband signal (from 53 kHz to 99 kHz) and are being used for a growing range of digital datacasting business applications. Such applications include wireless paging and messaging, stock quote and other text or data services, Muzak and other subscription audio services for professional doctors or other businesses.

**Scalability**

The ability of an electronic device or software-based system to dynamically manage input signals that span a range of transmission protocols, basic signal bandwidths, or data rate standards. Scalability is an increasingly important technical characteristic of open system architecture that can accept different signaling systems operating with an established range without having to upgrade or downgrade the entire network. An example is proposed new television production systems or television sets that will accept a range of television signal formats including current NTSC signals, new wide-screen signals, or future HDTV signals.

**Scan Conversion**

The electronic process of scanning text or picture images to convert a document or picture from print to an electronic digital signal for computer storage, desktop publishing manipulation, fax transmission or electronic printing production.

**Scan Lines**

Television pictures consisting of horizontal rows or lines of picture elements that are traced or "drawn" onto the screen by a scanning beam from an electron gun. The electron gun charges particles of phosphor that coat the inside of a tube or screen thereby causing the phosphor particles to glow to create video pictures. In the NTSC television format, up to 484 scan lines are drawn to create each individual picture frame. The definition or clarity of a television system primarily is determined by the number of scanning lines —current system standards use 525 (NTSC) and 625 (PAL) lines. HDTV systems will have 1,125 scan lines with commensurate quality improvements in picture clarity and detail.

**Scanning**

1. In television or video, this refers to the process of tracing over the scan lines of a television or computer monitor with an electronic beam to create video pictures.
2. The process of copying and converting a document or picture to an electronic signal. Two types of scanning exist when displaying information on a screen. Television broadcasting uses a process called interlaced scanning while most computer systems progressively scan an image. (See Interlace Scanning, Progressive Scanning, Scan Lines)

**SCMS - Serial Copy Management System**

A security copy protection device designed to limit the copying of digital tapes intended primarily for personal or home use.

**SCPC - Single Channel Per Carrier**

Transmission system often-used in satellite communications, especially audio radio networks or other relatively narrowband communications.

**Scrambling**

Refers to encryption processes used in telecommunications, video entertainment, and military communications, among others, in which signals are deliberately distorted using various techniques to protect privacy, prevent piracy or theft, or for reasons of national security. Essentially, scrambling is to prevent unauthorized persons from receiving or gaining access to communication signals. In simple video scrambling systems used by cable, DBS, MMDS or other pay-TV services, operators deliberately transmit an out-of-phase signal. Subscribers must have a special decoding device at the receiving end to restore the signal to regular phase for viewing. More sophisticated digital encryption techniques use algorithms of increasing complexity to prevent unauthorized access.

**Screen Real Estate**

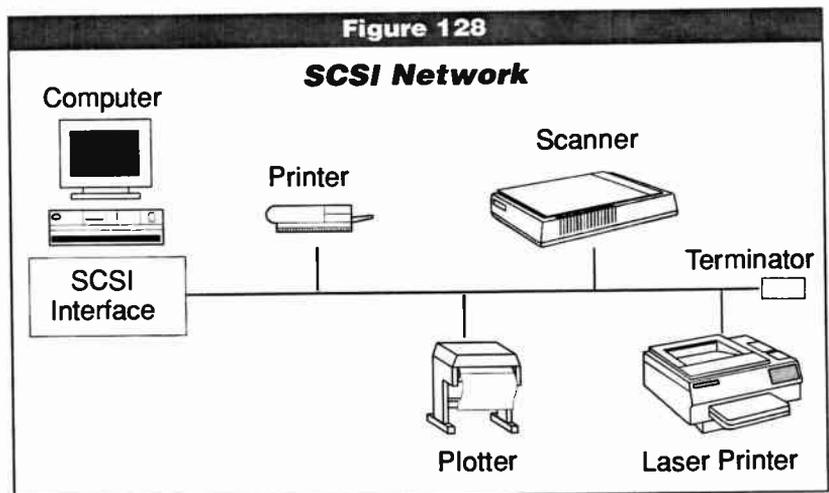
A term becoming commonly used to refer to the area or amount of free space available to computer users for the display of desired information that is not taken up by pre-set windows, scrollbars, banner advertising, sidebars, or other framed information on the computer screen.

**Screen Saver**

Originally developed to prevent an unchanging image on a computer monitor from "burning" into the phosphor of the screen thus damaging the monitor. With improved monitor technology this purpose is no longer as necessary. Currently, screen savers either blacken out a computer monitor display, or display some sort of changing pattern, animation or other dynamic content. Screen savers are activated if a computer goes untouched for a certain period of time typically between five to ten minutes. With current display technology the burn-in risk to monitors has been minimized and most screen savers act a form of personalized entertain. Screen savers also can be activated by a user to prevent others from viewing computer screen contents when the PC is unattended by not turned off. In high security work areas, computers often require users to enter a password to remove the screen saver in order to resume work.

**SCSI - Small Computer Systems Interface**

Pronounced "scuzzy," SCSI is a type of computer "bus" originally designed by Apple for its Macintosh system. It now has become an industry standard available on Intel-based PCs. SCSI is an efficient



**SDARS**

way for peripheral devices such as external CD-ROMs, external hard drives, scanners or printers, to communicate with a computer's main microprocessor or CPU. SCSI peripherals are linked serially to a single interface allowing up to seven peripherals to be controlled from a single SCSI card without involving the CPU. SCSI bus lines must be terminated at a SCSI peripheral or a self-terminator needs to be added to close the connection.

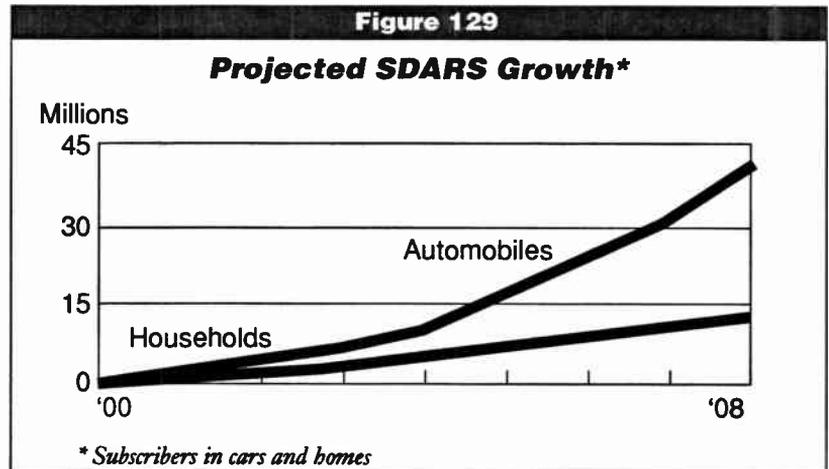
**SDARS**

Acronym for Satellite Digital Audio Radio Service providing consumers with satellite-delivered digital audio services. There are two leading SDARS competitors at present: Sirius Satellite Radio Inc. based in New York City (previously CD Radio Inc.) has backing from Loral, Ford, financier Sid Bass, and Apollo Investments. Rival XM

Satellite Radio, based in Washington, DC is backed by General Motors, DirecTV, and major radio broadcast group owner, Clear Channel Communications. Beginning early next year, both companies plan to use satellites to transmit 100 niche channels of news, talk, and music to consumers nationwide. The systems offer digital, CD-quality sound and in the case of Sirius, the business will be based on subscriber fees — not advertiser-supported revenues. Industry forecasts, if accurate, suggest that as many as 50 million people — most of them commuters, RV owners, and truckers — could sign up as subscribers by 2008. Users will either need to buy and install the small satellite radio receivers or drive cars that come factory-equipped with a satellite receiver that typically will be flush-mounted on the car/truck/van roof. After-market receivers will run about \$125 more than a typical car radio. Users will spend about \$10/month in subscriber fees.

Not to be diminished are the potential risk factors. SDARS satellites will operate in the S-band and due to propagation characteristics cannot deliver a perfect, continuous stream of music to listeners nationwide, especially as the signals are to be beamed to mobile receivers. Mountains, buildings, and even trucks moving alongside cars possibly could disrupt reception. To compensate, XM plans to build as many as 1,700 terrestrial transmitters in urban markets, and Sirius plans to build 110 terrestrial repeaters. To shore up support, SDARS companies have actively sought to recruit Detroit's automakers as backers. GM and Ford will install their respective partners' receivers in new vehicle models beginning in late 2000. Other carmakers are expected to announce support for one or both operators after the initial start-up. To break even on cash flow, Sirius has said it needs subscribers equal to only 1% of the 180 million vehicles on the road in the U.S. today.

Plans for SDARS operations have been long in development, but industry analysts see the potential to reach break-even fairly quickly once the two U.S. systems begin operations in the next 18 months, according to Steve Blum, president of Tellus Venture Associates. There is growing financial investment industry support for the U.S.-based services — Sirius Satellite Radio and XM Satellite Radio. Market analyst estimates suggest that the SDARS services in the U.S. could have a combined 50 million subscribers by 2007. Factors seen a key developmental forces

**Figure 129**

Source: C.E. Unterberg, Towbin

include lower cost for program acquisition, adoption of a interoperable receiver standard sooner, than expected and strategic alliances with major automobile manufacturers for satellite-capable factory installed radios.

Lower costs of acquiring radio programming compared with satellite video operations will enable SDARS services to reach a positive cash flow within their first two or three years of operation. Strategic alliances with major U.S. automakers

are a second key factor supporting financial sector optimism for the satellite radio industry. Sirius Satellite Radio (former CD Satellite Radio/CDR) has forged a partnership agreement with global automaker DaimlerChrysler giving it an exclusive link to North America's third largest automobile manufacturer. XM Satellite has a similar partnership agreement with the leading U.S. automobile manufacturer, General Motors.

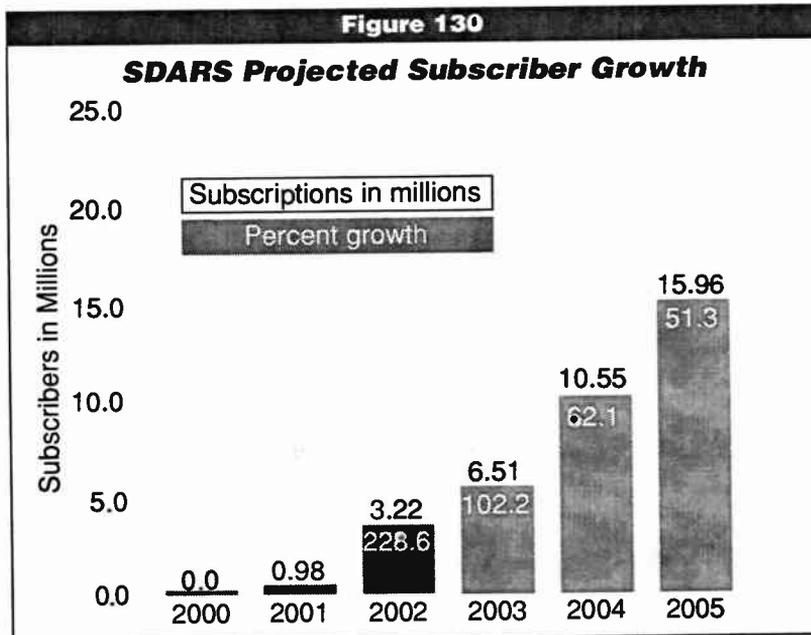
Agreement on a single receiver standard enabling consumers to purchase one radio capable of receiving signals from both companies was announced in February 2000. The interoperability standard was a requirement by the FCC in licensing to the two SDARS companies thus an agreement had been expected, however, the agreement come much sooner than most expected and thus is expected to help to boost industry growth. Due to the interoperability standard, each satellite radio receiver will have the potential of receiving 200 channels rather than 100 channels as previously envisioned. A single standard will cause an earlier ramp up in adoption, a larger penetration rate and an improvement in gross margins, but on the negative side the churn rate is expected to increase slightly. As a result of the single standard agreement, both companies estimate that subscriber potential would increase by about 10 percent from their current estimate of 43 million to 45 million potential subscribers. Equipment with the interoperable standard is expected to be in second-generation equipment deployed in 2004. (See Worldspace, XM.)

**SDTV - Standard Definition Television**

Acronym that describes a set of digital television formats with approximately the same or slightly better resolution than the existing NTSC television standard. Both wide screen and standard aspect ratios for SDTV are included in the Advanced Television Systems Committee standard for ATV that has been recommended to the FCC for adoption as the digital television standard in the U.S.

**Sea Launch**

The first ocean-going mobile spaceport platform for launching communications satellites into orbit. Sea Launch's self-propelled platform and accompanying command ship offer communica-



Source: Tellus Venture Associates, January 2000

## Search Engine - Secondary Colors

tions providers and satellite companies literally a new vehicle for launching satellites. Sea Launch is an international partnership with consortium members including a Boeing Co. subsidiary with a 40% ownership stake, RSC Energia, the Russian rocket manufacturer, Europe's largest ship-builder, Kvaerner Maritime of Norway. Sea Launch's equatorial sea-based lift-offs can take full advantage of the Earth's faster spin rate at the equator for launching heavy satellite payloads. At the north and south poles the Earth's rotational speed is zero, but as the distance from each pole increases the planet's rotational speed also steadily increases. At the Equator, the surface of the Earth is moving at a rotational speed of more than 1,000 mph providing an additional boost for rocket launches. Due to the Earth's rapid eastward spin at the equator Sea Launch payloads can be as much as 30% heavier than if launched from other land-based facilities. In addition, space vehicles fired from the Equator travel shorter distances into orbit, so less fuel is required. The 200-foot-tall Russian Zenit-3SL rockets used by Sea Launch can manage some of the largest satellites in the world. The launch pad, called the Odyssey, is a converted sea-based oilrig with steel columns that can be filled with 15 tons of water to partially submerge the platform to stabilize it even in heavy seas. The Sea Launch Commander ship will be the rocket assembly site as well as provide remote mission control functions for launches. The consortium anticipates six to 12 lift-offs a year of communication and scientific satellites. Due to a World Bank investment agreement the consortium is prohibited from making military launches.

### Search Engine

A remotely accessible program available on the Internet that enables users to perform keyword searches for information located across the Internet. There are several types of search engines. Some search engines maintain a directory of websites that have been provided to them by users attempting to get their websites listed in the directory (such as Yahoo). Other search engines are designed to generate their lists automatically by using powerful computers to perform automated searches by "crawling" over all located websites, extracting specific textual information which subsequently is stored in a searchable database (e.g., Northern Light and Alta Vista) for access by the user. (See Bot, Portal, Spider)

### SECAM - Sequential Couleur Avec Memoire (Sequential Color with Memory)

A European television standard pioneered by the French and primarily used in France and Russia. SECAM has 625 video scan lines and operates at a frame rate of 25 Hz. The SECAM system used in France utilizes a technique called "Positive Video Modulation" where the change in luminance is reflected positively rather than negatively as in the NTSC television system. Confusing some matters further, different standards for modulation for SECAM vary from country to country. SECAM signals are similar to the European PAL system in that they use the same amount of bandwidth per channel (8 MHz) and interleaved color difference signals. (See PAL)

### Sector

In computer environments, a sector is a portion of computer hard disk or floppy disk. Hard disks are divided into tracks and sectors with a sector being a portion of a track. (See Hard Disk)

### Secondary Colors - Cyan, Yellow, and Magenta

In the NTSC television system, the primary colors used are red, green, and blue. Secondary colors are Cyan, yellow, and magenta and represent colors that are halfway between the primary values of red, green, and blue. Cyan is a mix of green and blue, red and green creates yellow, and magenta is a combination of red and blue. Every color available for use in NTSC television is based on these six colors and is seen occasionally as the color bars that may appear on a television screen. (See RGB)

**Secure Electronic Transaction (SET)**

A secure payment protocol developed by MasterCard and Visa designed to ensure security for bankcard transactions over the Internet. It denies merchants access to credit card information, thus keeping it secure between the shopper and the bank.

**Secure HyperText Transfer Protocol (S-HTTP)**

A secure version of HTTP, developed by Netscape, that provides general transaction security services over the Web.

**Secure Server**

Refers to a computer network server system using fairly sophisticated encryption to enable users to submit and receive sensitive information such as credit card numbers in a protected environment. Most Web servers use some form of encryption to protect consumers, but these encrypted messages/codes can be "cracked" by serious hackers. (See Encryption, Hacker, SSL)

**Secure Sockets Layer**

(See SSL)

**Seek Time**

Refers to the time it takes for a disk drive to move its head(s) from one track to another. The seek time is one of the most important factors determining the speed at which data can be written to or read from a hard drive.

**Segue**

Pronounced "seg - way," from a root word "seguire" meaning to follow, or to continue without a break. A term used often in video broadcasting, where to segue means to make a smooth transition from one piece of video or audio segment to another, such as the break between a television program and a commercial. In this type of segue, the television program fades to black as the commercial is cued to its starting point creating a seamless transition.

**Self-Diagnostic**

The ability for a computer, telecommunication, or other electronics-based system to perform standard internal diagnostic checks for system errors or abnormalities.

**Serial Interface Port**

In computer environments there are two types of interfaces for external devices. A serial connection or serial port is a particular interface that transmits digital data in a bitstream of one bit at a time, in each direction. A serial connection is somewhat like a two-lane road with one lane on each side traveling in opposite directions. The second interface is a parallel interface or port. (See Parallel Port)

**Server**

A type of computer providing specific kinds of services to "client" computers or terminals connected to a network. A single server could perform as a type of CPU for a LAN network as it would be loaded with several different software packages providing many different services to "clients" on the network. (See Active Server Pages, Apache Web Server, Exchange Server, Client/Server, Hosting, Proxy Server, Secure Server, SSL, Web Server)

**Servomechanism**

Refers to an automatic control system in which the electronic mechanical device output is

**Session Layer - Sidebands**

intermittently, or in high tolerance manufacturing systems constantly, compared with the input through a feedback loop. From the comparison task and any resulting difference in input vs. output quantities or parameters, the servomechanism system or device uses the information to recognize when to initiate the next function or control sequence.

**Session Layer**

A structural layer within the digital Open Systems Integration model.  
(See OSI)

**Set-top Box**

Refers to an increasingly complex set of electronic decoding and encryption systems being developed for use with future broadband interactive video systems by the cable and telephone industries. Existing set-top converter boxes used in cable television systems or other video distribution services such as DBS or DTH essentially function to unscramble and/or decode digital video signals that have been encrypted for transmission. Cable pay-per-view services, as well as premium movie and other channels, require decoding that is handled in the set-top box. In the future, video-on-demand and other promised interactive video and information services will be some of the forces pushing set-top box designs toward more expensive intelligent terminals. (See IRD)

**Shareware**

Refers to computer software that is made available on a "try-before-buy" basis. Generally, shareware software doesn't contain all features or functionality of a complete program package and is intended as a marketing tool to encourage users to purchase a complete package. Major sources of shareware are files that can be downloaded from the Internet. Shareware differs from "freeware" in that shareware programs must be purchased to obtain full functionality and features whereas "freeware" is really free to any user that downloads it. However, for both shareware and freeware software the copyrights remain with the originator.

**Shockwave™**

A program from Macromedia for viewing files on the Internet created with Macromedia Director software. Shockwave provides users with fully interactive multimedia capabilities, clickable, dynamic animations, graphics, text, and audio directly from a Web browser providing the Shockwave plug-in is installed which is freely available on the Internet. (See Flash, Plug-in)

**Shopping Cart**

Web software used by online retailer (a.k.a. e-tailers) to enable consumers to specify items they would like to purchase, review their selections, and then proceed to "check out" to provide credit card information to pay for the items purchased. (See E-commerce)

**SHVA / SHVIA**

Acronyms for the Satellite Home Viewer Act (SHVA - pronounced "shiva"), and subsequent legislation enacted in late 1999: The Satellite Home Viewer Improvement Act" (SHVIA). The legislation regulates the transmission of broadcast television station signals to home dish receivers, including the provision of local television station signals to subscribers in the stations' local markets. (See Local-into-Local, Must-Carry, and Retransmission Consent.)

**Sidebands**

Simply, sidebands are the places in a transmitted signal where the information is carried. The energy resulting from the modulation of a carrier wave frequency produces a set of sideband

frequencies, which are created or produced both above and below the main frequency. Most, but not all, RF signal modulation systems create sidebands because in some systems one sideband is filtered out before transmission.

**Sidetone**

A sidetone in a regular telephone voice conversation allows the speaker to hear himself through the receiving end of the handset.

**.sigfile**

An Internet term used to describe the signature an Internet user puts at the end of all transmissions. Supposedly short, identifying descriptions some Internet users have gone into great detail using multi-line and multi-page .sigfiles.

**Signal Acquisition**

Refers to a series of technical procedures completed by ground station operations in the satellite communications field for synchronizing and locking electronic tracking equipment onto the pilot signal(s) being transmitted from a communications satellite. Satellite acquisition operations are used for installing DTH dishes for consumers, maintaining station-keeping operations for geostationary communications satellites and tracking deep space probes to the outer planets.

**Signaling**

The process of contacting a device, system, or part of a network in searching for the correct address or destination for a transmitted signal, message, page or other communication link. In effect, the sender, intelligent packet data, addressed signal is trying to gain the attention of the receiver system.

**SIMM - Single In-line Memory Module**

A narrow printed circuit board that holds memory chips and plugs into a SIMM socket on the motherboard or memory board. The first SIMM format that became popular on personal computers was 3.5" long and used 30 pins. A larger 4.25" format with 72 pins came later that would hold from one to 64MB of memory. SIMMs have evolved into dual modules (DIMM - Dual In-line Memory Modules) with 168 pins which double the number of circuits to/from the module. DIMMs can be added one at a time on a Pentium motherboard, whereas SIMMs are generally used in pairs, and in groups of four for older computers.

**Simplex**

Refers to any communication system where transmitting channels or paths can be used in only one direction at a time. Information can either be transmitted or received but not both simultaneously. (See Duplex)

**Simulation**

Sophisticated software system enabling users to "exist" in virtual environments or situations for purposes of training, practice, or for developing testable scenarios to improve system engineering designs. High-end graphics flight simulators for pilots, astronauts and others in highly technical critical decision-making environments are commonly used for training and system testing efforts. In communication network engineering, simulation networks are designed, developed and tested in R&D phases prior to any actual implementation. Simulation testing is used to reduce possible errors in system development and thus eliminate costly design revisions. (See Virtual Reality)

**Single Mode**

A type of optical fiber communication that focuses a single beam of light through a smaller

**Site - Small Computer Systems Interface**

medium than multi-mode fiber. The fixed, concentrated beam of light can send more information over longer distances than multi-mode. (See Multi-Mode Fiber)

**Site**

In cyber realms, refers to a location on the Internet specified by a domain name and unique IP address. A domain is Internet nomenclature for the "owner" of a particular Web address or site on the Internet. The domain or site on the Net for the National Association of Broadcasters is www.nab.org. Domain names are structured in a standard way. NAB registered to acquire "nab" as it's domain name and the extension ".org" denotes a non-profit organization. (See Domain, Dot.com, InterNIC)

**Site License**

Refers to the process of granting paid access to software and services throughout an institution, organization or company. Typically, vendors offer site licenses at rates far lower when compared to purchasing many copies "off the shelf." (See Application Service Provider, Network Computer)

**SKU**

Acronym for stock-keeping unit used by most retail stores as a number designating one specific product.

**Slamming**

Aggressive type of competitive – bordering on "guerrilla" – marketing tactic among the nation's long-distance telephone companies to sign up customers for their services. Slamming occurs whenever a customer's long-distance service is switched from one long-distance company to another company without the express permission of a customer authorizing the change, and thus in violation of FCC rules. Often customers tacitly agree to changing companies by not responding to a promotional inquiry by one company that requires a negative response (e.g., No, do not change my LD provider). Another tactic is to switch customers if they accept a low promotional "teaser" rate for service for a limited amount of time, usually accompanied by minimal or waived charges for making the switch.

**Slave**

A reference in electronic recording and editing to machines used for copying recorded video or audio material from a master videotape unit that has a master recording or tape loaded on it.

**SLIP - Serial Line Internet Protocol**

An Internet transmission standard allowing users to use a regular telephone line (i.e., a serial line) and a modem to connect a computer to an Internet site. SLIP accounts are gradually being replaced with the more versatile point-to-point (PPP) protocol. (See Point-to-Point Protocol)

**Slots**

In general, a slot usually refers to a connecting point on any communications system or network bus. In a computer, expansion slots are used to insert circuit add-in cards to allow the computer to connect with various peripheral devices. Expansion slots are intended to extend or expand the functionality of a computer. Examples of electronic devices that can be attached to expansion slots are fax modems, audio sound cards, or Network Interface Cards (NICs). (See Bus, Expansion Slots, NIC)

**Small Computer Systems Interface**

(See SCSI)

**NAB**

**Smart Appliances**

That's no refrigerator, it's a command center" is likely to become an advertising campaign slogan in the near future. Smart appliance technology is being developed and displayed in prototype forms at consumer industry trade shows by companies including Whirlpool, Sunbeam, and General Electric. The intent is to develop home/office appliance systems that allow these units to evaluate conditions and then communicate status condition with the consumer or other appliances. Companies anticipate, for example, that with this technology refrigerators will be able to keep track of the food they contain and efficiently communicate this information to consumers. The large issue now in question is that of creating a system of communication largely accessible to different brands. Currently, Sunbeam's products are set on a system unconnected to the Internet, while General Electric is working with both Sun Microsystems and the Universal Plug and Play Forum —comprising IBM, Sony, and other companies — via a deal with Microsoft. A question manufacturers have is what potential buyers would want these systems to do. (See Information Appliances)

**Smart Cards**

Similar in size and shape to common credit cards, smart cards come with an integrated circuit that can be programmed to perform many different functions, such as identification, access control, purchasing, exchange value, pre-paid services, and selected information access. There are three types of integrated circuit cards: simple memory card, hardwired logic card and microprocessor card. (See Authentication, PIN.)

**Smart Home**

Supporters of TV-centric smart homes include consumer electronics giant, Sony, which is about to introduce its first TiVo-based personal video recorder (PVR). Sony envisions its advanced television recording product as evolving into the central "server" for a home network system that can provide services from voice mail and video games to music-on-demand. In a more near-term perspective, Microsoft's Bill Gates asserts that every new computer sold in 2001 will feature a home entertainment recording option on its hard-disc drive similar in function to PVRs. (See HLT, PVR, Datacasting.)

**Smart Terminal**

A computer terminal or other electronic system, such as an advanced set-top box, that, to some degree, is able to process, perform or function independently. Smart or intelligent terminals are the opposite of dumb terminals, which are usually attached to a computer processor that performs all functions. Smart terminals with growing built-in capabilities are able to accept programming instructions, user commands, and interactive input. Such devices also can perform many functions previously unavailable on computer terminals or other types of display and reception devices such as television sets.

**SMATV - Satellite Master Antenna Television**

A type of satellite-delivered pay-TV service where satellite cable network and other video programming is distributed throughout an apartment complex, other building complex, or any other multi-user facility such as a hospital. SMATV services often distribute cable and pay-per-view programming and combine these signals with local broadcasting channels for a package of signals to end-users.

**SMDS - Switched Multimegabit Data Service**

A public data transmission service aimed at enterprises that need to exchange large amounts of data with other enterprises over a wide-area network on a non-constant or so-called "bursty"

**SMR - SNG**

basis (i.e., data comes in bursts not in a continuous stream.) In general, SMDS extends the performance and efficiencies of a company's local area network (LAN) over a wide area on an as-needed basis. SMDS is connectionless, meaning that there is no need to set up a connection through the network before sending data. This provides bandwidth-on-demand for "bursty" data transmission typically found on LANs. (See Intranet, LAN)

**SMR – Specialized Mobile Radio**

As defined by the FCC, SMRs are private, two-way radio systems providing land mobile wireless communications to eligible persons on a commercial basis. Typically refers to analog wireless mobile services that provide dispatch services to taxi cab fleets construction firms, and other mobile workforce users. In the past, SMRs were trunked radio systems providing relatively localized services with several users sharing a few channels. Nextel has significantly reshaped market prospects by constructing a nationwide enhanced wireless network to compete head-on with cellular and PCS services. (See ESMR)

**SMTP – Simple Mail Transfer Protocol**

(See Internet Protocols.)

**SNA – System Network Architecture**

An acronym created by IBM to describe the design and protocols of network operations.

**Snail Mail**

A term, not always used in the most complimentary sense, referring to mail delivered the old-fashioned way via the postal service. The term has arisen due to the ability to send messages instantaneously via electronic mail systems thus regular postal service mail is considered by e-mail users to be comparatively slow.

**Sneaker Net**

A computer industry reference to the physical act of carrying messages from one location to another compared to using electronic means such as local area networks, which at times is easier, quicker, and/or more reliable. Computer users within a corporate facility might copy information onto a floppy disk from one computer just to hand carry the disks to another computer to transfer files that have to get their ASAP.

**SNG – Satellite News Gathering**

A broadcast news operation originating out of Electronic News Gathering (ENG) in which satellite newsgathering vehicles or trucks are dispatched to remote sites for immediate news taping or live broadcasting of breaking news events. SNG vans or trucks are usually equipped with single or multiple satellite dish antennas used for uplinking and downlinking video news footage to and/or from a variety of sources. SNG operations are used by local television stations, the national TV networks, cable news operations such as

**Figure 131****SNG Vehicle**

Source: Advent Communications

CNN, and international news organizations such as the BBC. Private video services use SNG vehicles for taping video segments (from covering local sports or concert events) that are then transmitted to a main satellite telecommunications operations center (TOC) for worldwide distribution. CONUS Communications, a subsidiary of Hubbard Broadcasting, was the first major SNG service developed in the early 1980s and led to the adoption of SNG operations by the major networks.

**Sniffer**

Refers to a computer program or a hardware device that is used to monitor data traveling over a computer network. While a sniffer can be used by network managers to make sure their network is running properly, it can also be used by hackers or data criminals to obtain sensitive data such as user names and passwords that would allow access to private portions of the network. Because sniffers are almost impossible to detect, and they can be installed almost anywhere that network cables exist, they are one of the most common tools used to break into secure computer environments. (See Hacker)

**SNMP - Simple Network Management Protocol**

A software management tool for computer/communication LANs used in conjunction with Internet TCP/IP protocols to facilitate communications between interconnected on-line networks. SNMP provides a set of rules for exchanges among various networks. Examples include HP Openview, Sun Net Manager, and IBM Netview. (See LAN, TCP/IP)

**SNR - Signal-to-Noise Ratio**

(See S/N)

**SNV - Satellite Newsgathering Vehicle**

Refers to the vehicles, trucks, vans or other mobile transports used in carrying the necessary satellite antenna for reception and/or uplinking signal transmission and other video and audio tape editing, mixing and related production equipment used in satellite newsgathering operations. (See SNG)

**Software**

Software typically refers to a specific set of computer instructions or program written for executing a specified computer application. More recently the term software is being applied generically to refer to any non-hardware system(s) including program applications, internal operating systems, user interfaces, electronic mediated products such as movies, audio recordings, electronic video games, etc.; essentially, software is anything created or produced as intellectual property. (See Intellectual Property, Wetware)

**SOHO - Small Office / Home Office**

Shorthand moniker for the Small Office/ Home Office segment of the business equipment market typically used in the promotions, marketing and sales of computer and related telecommunications equipment, software and services designed specifically for the smaller business office.

**SONET - Synchronous Optical Network**

A technical standard for optical fiber communications networks implemented as telephone protocols for transmitting digital information over synchronous optical networks. High-speed SONET architectures and transmission protocols are designed to take advantage of the huge bandwidth transmitting capacity available with broadband fiber optic networks. SONET systems

## Source Code - Spectrum

currently can transfer data at 51.84 Mbps or higher, and rates are expected to reach up to 2.4 Gbps depending upon the grade of the optical switching interface. (See Interface)

**Table 39**

### **SONET Transmitting Standards**

Optical Carrier Level	Transmission Data Rate	System Capacity Equivalents	System Notes
OC-1	52 Mbps	28 DS-1s or 1 DS-3	Basic SONET Rate
OC-3	155 Mbps	84 DS-1s or 3 DS-3s	
OC-9	466 Mbps	252 DS-1s or 9 DS-3s	
OC-12	622 Mbps	336 DS-1s or 12 DS-3s	Fastest ATM Speed
OC-18	933 Mbps	504 DS-1s or 18 DS-3s	
OC-24	1.2 Gbps	672 DS-1s or 24 DS-3s	
OC-36	1.9 Gbps	1,008 DS-1s or 36 DS-3s	
OC-48	2.5 Gbps	1,344 DS-1s or 48 DS-3s	Fastest SONET Speed

Source: Bellcore

### **Source Code**

The "raw" or "uncompiled" code written by computer programmers which is the basic sources of software program applications eventually compiled, released or used as systems/network programs, business firmware, or consumer application products, among others.

### **Spamming**

A cyber term for the broad distribution of unsolicited bulk e-mail or cyber junk mail. Several states including Virginia and Washington, already have enacted laws to restrict spamming activities, and laws are being proposed or considered in dozens of other states. To prevent reception of such mail, an individual Web user might post an email address to defeat automated scanners looking for the "@" sign in an email address (e.g., for example, enter your username and then use [at] instead of @ in the address.) Listserv vendors are able to add software filter to prevent spamming message from being passed along, but these often are an insufficient defense against serious spammers. Filling in website forms requesting a personal e-mail address could make a user a clear target for spammers. Also using an anonymous FTP is another way to inadvertently become part of a spammer's mailing list. As a first line of defense, Web users only should provide personal information to the Web the sites of reputable companies or organizations. (See E-mail, Newsgroups, Usenet)

### **SPARCstation™**

Refers to a family of workstations manufactured by Sun Microsystems based on the SPARC (Scalable Process Architecture) system. These systems are typically used for high-end computer graphics, complex computer modeling and simulations.

### **Specialized Common Carrier (SCC)**

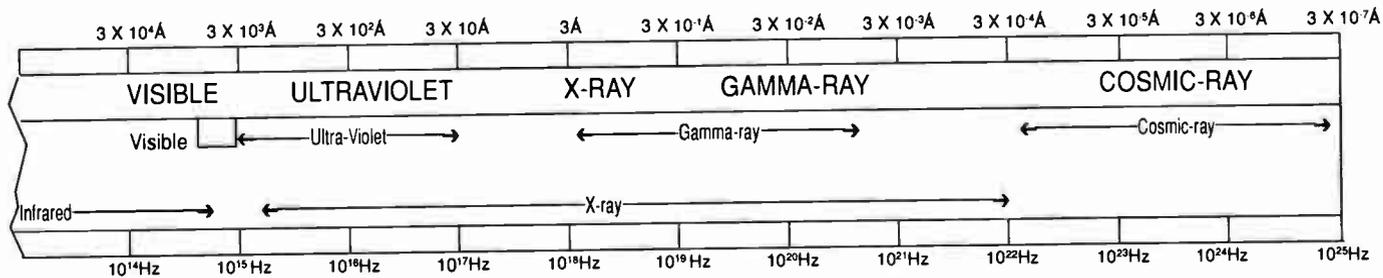
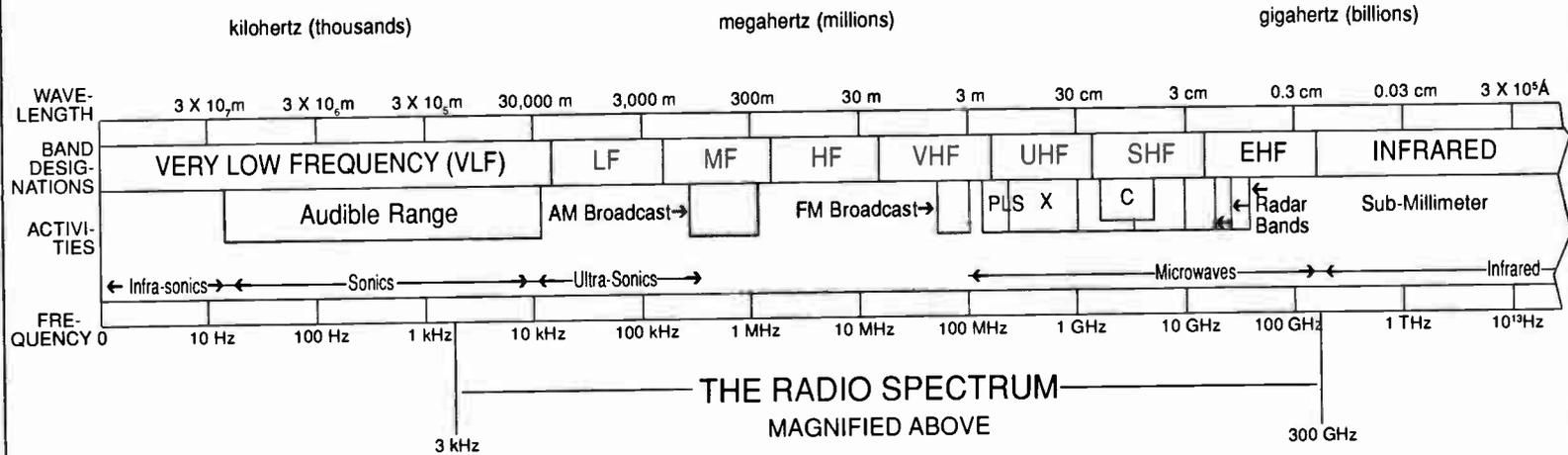
Refers to companies (other than telephone companies) that provide point-to-point communication service on a common carrier basis. For example, a Specialized Common Carrier might connect points on a telephone network that normally cannot be connected using standard wireline or fiber optics because of rugged terrain/inaccessibility.

### **Spectrum**

Spectrum refers to a continuous range of signal frequencies making up the visible spectrum of light and colors, and invisible frequencies of radiant energy including the portion referred to as

Figure 132

### Electromagnetic Spectrum



**Spectrum Sales - Spoiler**

the electromagnetic spectrum used for communications services. The electromagnetic spectrum has been used for communications due to its characteristics of linking magnetic and electric fields, and favorable propagation properties. Advances in technology continue to expand the range of "usable" spectrum for communication, scientific and other applications. The Federal Communications Commission authorizes allocations of spectrum frequencies for commercial purposes and government allocations are authorized by the NTIA. (See Allocation)

**Spectrum Sales**

The U.S. government is developing plans to open up access to spectrum resources essentially by treating electromagnetic frequencies as commodities to be bought and sold outright. This is different than the auction process, which is expected to continue for blocks of spectrum assets. Officials at the FCC are preparing rules to create a trading system whereby communications companies – from radio stations and telephone companies to purveyors of wireless Internet services – could bid for underused "slivers of spectrum" already licensed to others. Under the present system, the Federal Communications Commission issues licenses to commercial users and regulates the allocation of frequencies and signal power allowable for the licensed service. License holders were awarded spectrum allocations without required purchase payment, but typically with extensive set of legal rules and FCC regulations imposed on the licensees. In the past decade, many license rights have been sold at auction as result of the demand for new wireless communications cell and PCs phones, beepers, pagers, advanced mobile satellite services. Competitive market forces and increasing consumer demand for wireless reception devices has prompted the FCC to warn that demand is outstripping supply. This may lead to a so-called spectrum drought, making access to finite spectrum resources even more valuable both to "havens" and "have-nots" alike. (See Auction)

**Speech Recognition (Voice Activation)**

A developing field of electronics and advanced computer software enabling electronic devices to discern different vocal patterns and process selected voice commands. Computer-based speech recognition systems are programmed to analyze or recognize relatively simple vocal patterns and tones that correspond to selected pre-programmed commands that initiate desired user tasks. (See Voice Activation/Recognition)

**Spider**

Also referred to as a "robot" or a "crawler," a spider is a program that automatically explores the Web for specific document information to retrieve, and then stores the information in a searchable database. Other Web pages linked to a "found" document also are "crawled" over and their contents are recorded. Some of the most popular search engines on the Internet use spiders to seek specified information include Alta Vista, Northern Light, Webcrawler, and Hotbot. (See Bot, Search Engines)

**Splicing**

Used in communications, splicing refers to the process of connecting two wires, fibers, and pieces of video or audiotape. Splicing is done to repair or extend a communications line to cover a longer distance, or in the case of magnetic tape splicing, is done for a variety of repair, editing, or other purposes.

**Spoiler**

Refers to a remark usually contained within an email message, which reveals important plot elements from books or movies, thus denying the reader the proper suspense when reading the book or watching the movie. Generally, a spoiler can be any remark that telegraphs the solution of a problem or puzzle, thus denying readers the pleasure of working out the correct answer themselves. (See E-mail, Newsgroups, Usenet)

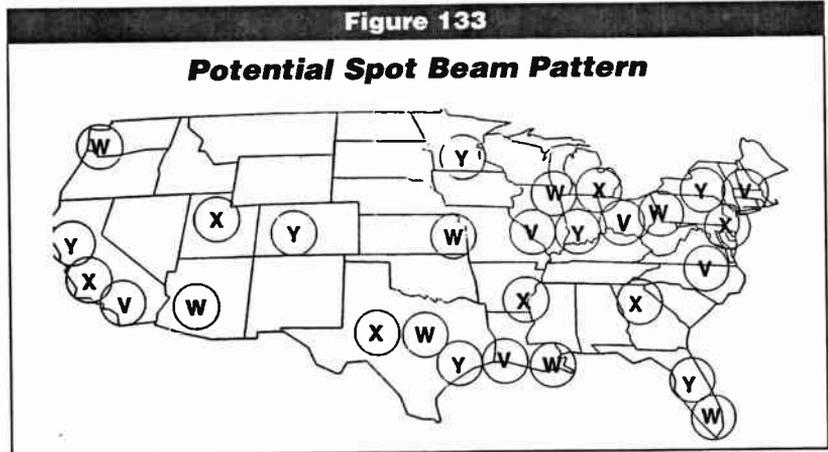
**Spooler**

Typically refers to a program that controls the order of print jobs sent to a central printer. The spooler controls the queuing of print jobs, allowing many users to send documents to a printer simultaneously.

**Spot Beam**

A satellite-transmitted signal or beam that is relatively narrow or tightly focused in order to concentrate satellite power to a limited geographic area. Spot beams are being used in commercial satellite services such as DBS services in Latin America to direct services to certain broad areas to serve local language requirements. Very

narrow spot beams or pencil beams are feasible and may be used for DBS or other satellite-base services to serve certain geographically clustered populations narrowly based in certain geographic locations such as Chinese populations in San Francisco or Vancouver.



**Spreadsheet**

A category or type of electronic computer-based software application originally developed for business accounting purposes, but often now is used to aid in decision-making (e.g., what if, queries) and as well all types of record-keeping tasks. Spreadsheet software essentially organizes

Figure 134

**Example of a Spreadsheet Table**

**Personal Accounts**

Savings/Checking	Interest*	Yield*	Balance	Performance (% Change)		
				YTD	1Yr	3 Yrs*
Savings Account – Bank A	3.45%		3,510.00			
Certificates of Deposit (CDs)	4.60%		2,530.00			
Money Market (MM)	4.10%		2,300.00			
<b>Equity Holdings</b>						
Fund A			1,000.00	9.88	11.97	19.48
Fund B			1,500.00	10.32	17.08	20.61
Stock Co. A		1.52%	600.00	3.16	4.85	12.11
Stock Co. B		4.31%	1,400.00	4.04	6.03	12.39
Stock Co. C			2,200.00	9.65	12.44	17.89
<b>TOTAL</b>	As of:	9/01/98	\$15,040.00			

\* Average Annual Return

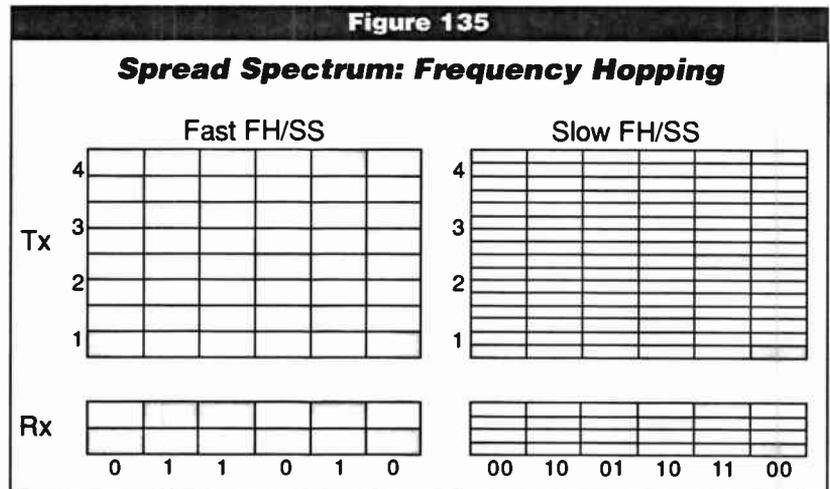
## Spread Spectrum - SQL

information into grid-like tables containing information that can be expressed in text or numerical values. Spreadsheet tables consist of labeled columns and rows that make up a grid of individual "cells" which contain the actual information or data values. Often there are many different subsets of data within the same spreadsheet file, often called a worksheet. Users can define types of cell data and the relationships between cells by using basic mathematical formulas that automatically update summary data once new information is entered in a primary cell. Current spreadsheet software includes Microsoft Excel, Claris Works, Lotus 1-2-3 and Quattro Pro, among others. All of these computer spreadsheet software applications do much more than simple tables. Most provide sophisticated data management functions include graphical charting based on table data, and often have powerful statistical analysis capabilities, and integrated Web functionality making spreadsheet files easily transported via the Internet.

### Spread Spectrum

Spread spectrum is a digital transmission technique based on quick transference of signals from one frequency to another frequency in a pseudo-random manner. The so-called frequency hopping technique is used to minimize potential loss of information due to normal interference effects that would be encountered on any

single transmission frequency path. Such frequency shifting techniques require that only a small portion of the information be transferred over a frequency channel at a given time. At the receiving end, special decoders collect all the bits of digital information from the various frequency channels and reassemble them into the original transmitted signal. The technology was first used for military communications to prevent deliberate jamming or interference. Essentially, the technology takes the information-bearing signal and disperses it over a wide range of frequencies so that noise impulses and other interference will affect only a portion of the total information transmitted. Any disruptions can be filtered out and/or corrected through digital encoding/decoding techniques. If the transmission protocol uses a set of narrowband digital signal channels that are frequency-hopped through a series of available frequency segments, this approach is known as a type of code-division-multiple-access (CDMA). In CDMA, the information is spread throughout a bandwidth much wider than the actual bandwidth of the data alone. Each data bit is encoded with a binary sequence of tracking bits. Any receiver can recover the original information by using the same digital sequence to decode the data.



Source: Datacomm Research Co.

### SQL - Structured Query Language

An industry-standard language for creating, updating and searching a relational database management systems using a series of queries. IBM developed SQL in the 1970s for use in its System R products. SQL statements are used to perform tasks such as update data in a database, or retrieve data from a database. Some common relational database management systems that use SQL are Oracle, Sybase, Microsoft SQL Server, Access, and Ingres. Although most database systems use

SQL, most of them also have their own additional proprietary extensions that are primarily used only on their system. (See Relational Database, Data Warehousing)

### SS7 - Signaling System 7

An out-of-band signaling system that provides fast call setup by means of high-speed, circuit-switched connections and transaction capabilities that deal with remote database interactions. SS7 makes such enhanced telephony features as caller ID, call forwarding, and call waiting widely available. SS7 also plays an integral role in the deployment of ISDN. The SS7 protocol consists of four basic sub-protocols: Integrated Services Digital Network (ISDN), Message Transfer Part (MTP), Signaling Connection Control Part (SCCP), Transaction Capabilities Application Part (TCAP).

### SSL - Secure Sockets Layer

Refers to a protocol designed by Netscape Communications Corporation to provide encrypted (secure) communications on the Internet. SSL is commonly used to enable e-commerce customers to put personal information such as a credit card number into an electronic form on a website and have the information securely delivered to a website server without the possibility of any illegal interception of the data. (See Authentication, E-Commerce, ID)

### Stack

Refers to a computer stack, which is an ordered sequence of instructions, where the last instruction placed on the top of the stack is usually the first out. A stack is often referred to as a buffered or queued memory where commands, data, or instructions are temporarily stored while other functions are being executed.

### Standards-Setting

Technical standards are established or set by a professionally authorized industry organization, and/or national or international standards-setting body. There are more than 250 official technical standards-writing bodies working with, or under the auspices of, the major standard-setting bodies that are chartered or recognized as policy-neutral in their deliberations and recommenda-

Table 40

#### **Selected Technical Standards-Setting Bodies**

ANSI	American National Standards Institute
ATSC	Advanced Television Systems Committee
CCITT	International Telegraph and Telephone Consultative Committee
CSA	Canadian Standards Association
DIN	German Standards Institute (Deutsche Institut für Normung)
DOC	Canadian Federal Government Department of Communications
ECMA	European Computer Manufacturers Association
EIA	Electronics Industry Association
FCC	Federal Communications Commission (U.S.)
GED	Global Engineering Documents
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electronic and Electrical Engineers
ISO	International Organization for Standards
NRSC	National Radio Systems Committee (U.S.)
NTSC	National Television Systems Committee (U.S.)
VESA	Video Electronics Standards Association

## Star Switched Network - Still-Store

tions of a new standard. Formal standards are established typically after lengthy series of procedural meetings, committee, subcommittee, and working group examinations, and completion of research and evaluations. The work often involves laboratory and field testing, followed by a subsequent formal recommendation based on test results and analysis. As the globalization of business and trade accelerates, technical standards-setting activities are becoming more complex and have increasing impacts on economic business interests. As a result, pressures on – and within – standards-setting organizations are mounting as the particular interests of companies, industries, or national governments are enveloped in technical criteria and issues under consideration. (See Appendix for Standards-Setting Organizations)

### Star Switched Network

Refers to a particular type of telecommunications network topology or architecture often mentioned as the switched network the RBOCs would deploy to deliver broadband video and interactive services to residential homes.

### Star Topology

A computer network architecture which has a central point or hub through which all data transfers must pass; a type of hub and spoke approach for computer networking.

### Station

In the broadcasting industry, a station refers both to the business operations, as well as the physical plant of a radio or television broadcasting facility. In telecom and computer environments, a station is another name for a telephone or a computer unit connected to a larger LAN or WAN network. (See Workstation)

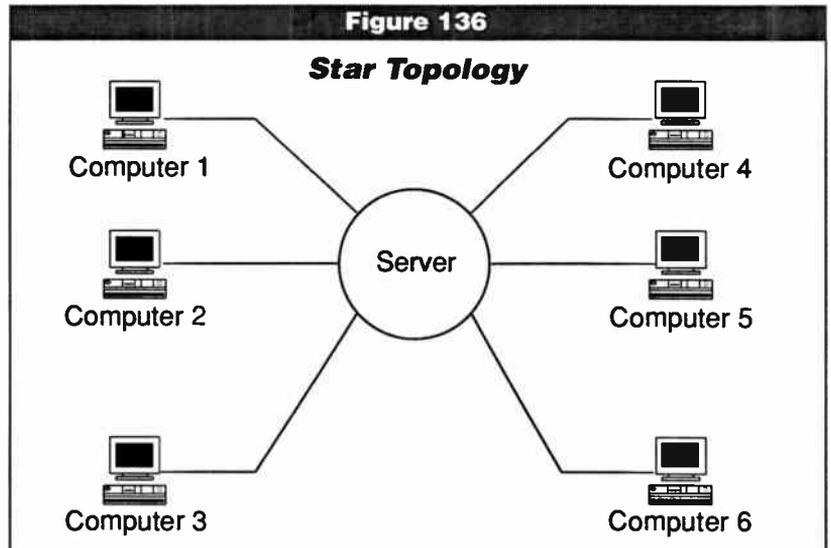
### Stereo

The transmission and/or reception of two separate audio channels — instead of only a single or monophonic audio signal — in a stereo receiver system which requires only one speaker. In stereophonic broadcasting, a second channel is transmitted which contains what is called the “stereo difference information” signal. Monophonic radio receivers have the ability to receive the first audio channel that is the sum of the two signals of audio information, but the second channel is ignored. Stereo receivers are able to receive and process the two separate signals for playback on left and right speakers.

### Still-Store

An electronic imaging device housing small disks that is able to store up to 50 still picture images. Through the use of a special camera, the disk records still picture images as an analog signal instead of through a chemical process.

**NAB**



Source: NAB

### STL - Studio Transmitter Link

A specific microwave link often used by a television station that is set up between the television station's studio and its main transmitter tower site. Television station transmitters often are located miles from a station's studio in order to provide better coverage of the service area from the transmitter. STLs are used for point-to-point transmissions of a station's RF video signal from the station's studio to the transmitter which then broadcasts the signal from the antenna tower.

### Storage

A broad term referring to any electronic process that retains or stores information. A range of approaches exist for different data, voice, video or other information formats. Storage facilities can be electronic, magnetic or optical. Computer RAM storage is electronic, storage on a computer

hard drive or a floppy disc is magnetic. Tape storage frequently used for data backups or audio and video recordings also are magnetic formats. Optical storage refers to optical or laser discs and is beginning to be used for many archiving storage tasks, but also for CDs and newer video entertainment systems. In both voice and computer data networking, temporary storage responsibility typically is allocated to an electronic buffer storage area. (See Buffer, Optical)

### Streaming Content

Playing sound or video in real time as it is downloaded over the Internet as opposed to waiting for the entire file to download, storing it in a local file, and then playing it after all of the data is transferred. A plug-in to a Web browser such as Netscape Navigator decompresses and plays the data as it is transferred to your computer over the Web. Streaming audio or video avoids the delay entailed in downloading an entire file.

Streaming requires a fast connection and a computer powerful enough to execute the decompression algorithm in real time. (See Plug-ins, Streaming Media, Windows Media Technologies)

### Streaming Media

Breakthrough digital streaming media software introduced by RealNetworks – and quickly followed by others – enables users to eliminate the process of downloading large audio or video files from the Internet before playing them back on a PC. Using digital streaming software technology users can click

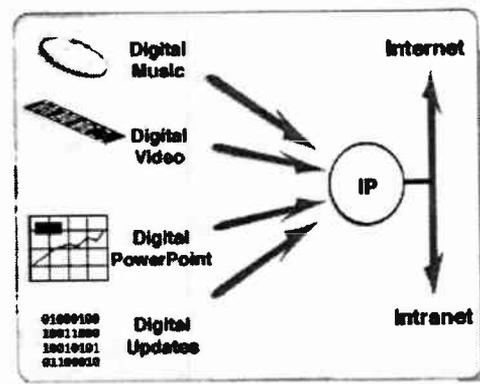
Table 41

### Digital Storage/Channel Capacity Measures

Storage/Channel Capacity	Unit of Measure
Bus Architecture System (size)	bits
Central Processing Unit (CPU) (word size)	bits
Memory Chip	bits
Computer Memory	bytes
Hard Disk/Tape Storage	bytes
SIMM /DIMM (Memory Modules)	bytes

Figure 137

### Streaming Media



Source: Multimedia Research Group, Inc;  
www.mrgco.com

## Stylus - Subcarrier

an on-screen icon or "hot spot" and hear audio segments or see video clips almost instantly. Streaming media technology takes advantage of digital compression to deliver taped or live audio or video content to Web users in real time. (See Hot Spot, MP3)

### Stylus

A pen-like device that emits an electrical signal that is used in some computer systems when used to write on a special graphics tablet. Pen-based computing and personal digital assistant (PDA) systems have been in development for a number of years but have yet to catch on. Such systems often are used for graphical drawings or for use as a pointing device similar to a mouse in making selections in menu-driven program systems.

### Subcarrier

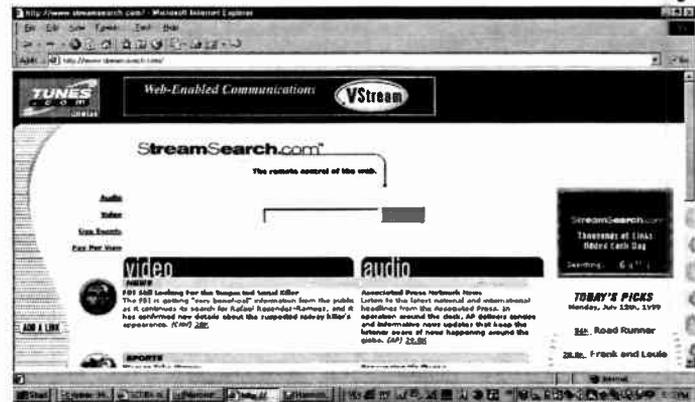
Subcarriers are part of a main transmitted RF signal and are used as a means of carrying information that is separate from the main information that is modulated onto a signal. To create a subcarrier, the information is inserted or embedded (by modulating it) onto a frequency that is relatively low compared to the carrier signal, but high relative to the digital rate of the information to be carried. Then the in-between carrier frequency is modulated onto the main carrier, which makes it a subcarrier. This commonly used process enables multiple sets of information to be carried in a

Figure 138

## Streaming Media Search Engines

StreamSearch.com™

The remote control of the web.



manner that allows different information signals to be separated into their original information forms at the receiver.

### Subnet

Refers to a portion of a particular computer network, which may be a physically independent network segment but shares the same network address with other

portions of the network. Such network “segments” are distinguished by a subnet number. Subnets are related to a particular network in the same way that a specific network is related to the wider Internet. The Internet is a network of networks and a particular network can be considered a network of subnets. (See Internet)

### Subscriber Line

Refers to any phone line that is leased from the telephone company including regular phone lines in homes or offices. In these cases, as a subscriber line, the account number is the Area Code + the seven digit telephone number. At the central office, this number is then dedicated to a specific telephone instrument at a specific location.

### Supercomputer

A broad term for one of the fastest computers currently available. Such computers are typically used for number crunching, including scientific simulations, animated graphics, analysis of geological data, structural analysis, physics, chemistry, electronic design, nuclear energy research and weather forecasting. The primary difference between a supercomputer and a mainframe is that a supercomputer channels all of its power into executing a few programs as fast as possible, whereas a mainframe uses its power to execute many programs concurrently. (See High Performance Computing, Mainframe Computer)

### Surround Sound

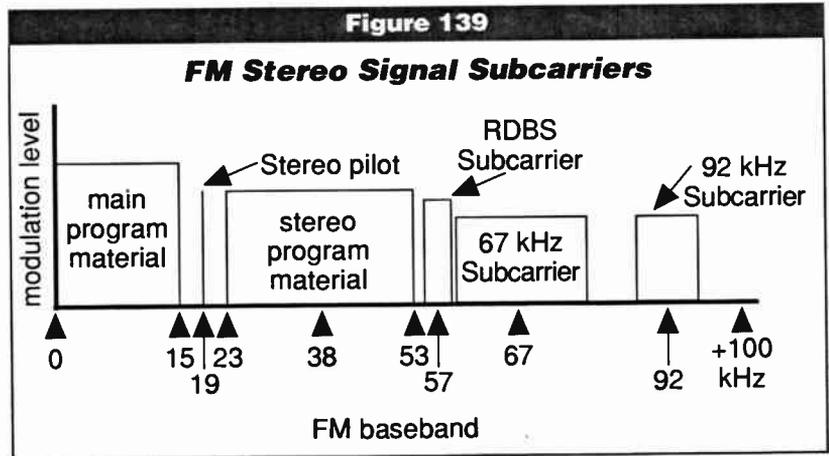
A stereo audio technique originated as a motion picture process to present a realistic sound environment in theaters. The original surround sound technique involved four separate audio channels and speaker units. Over time, theater sound systems developed into a speaker array in which three systems — left, center, and right channels typically are located behind the movie screen, and a U-shaped array of “surround” loudspeakers are placed in the rear of the theater. The proposed digital advanced television transmission standard will enable delivery of surround sound to homes once it is implemented.

### SVGA – Super Video Graphics Adapter

A higher version of standard VGA computer graphics adapter boards or cards. (See Graphics Adapter)

### Switch

An electronic matrix device for establishing, and completing or closing connections in an electri-



Source: NAB

**Switched Multimegabit Data Service - System**

cal or electronic circuit. These circuits can operate through electrical, mechanical, or optical means. The user establishes information to be transported, for example: voice, video, or data. The switch enables the user to route this information through a network to an end user. The user sending the information determines the end user's address. A video switch, or "switcher," is a device that is used in production facilities to determine which video source will be displayed during a broadcast or in post-production.

**Switched Multimegabit Data Service (SMDS)**

A technical standard for high-speed data transfer that supports connectionless high-speed data services which allow businesses and organizations to connect LANs through the public telephone network.

**Switched Network**

A telecommunications network that is able to transfer or switch calls from any point on the network to any other point or points depending on the communications format and services available to these terminals. (See PSTN)

**Synchronous Transmission**

In synchronous data transmission networks, digital bits of information are sent at expected time intervals, thus eliminating any need to transmit timing bits to establish a timing structure for the data stream. Information is transmitted at an established rate and the sender and receiver must have precisely synchronized clock functions. In asynchronous systems, a separate process is needed to periodically synchronize the two ends of the transmission channel. (See Asynchronous)

**SYNDEX - Syndicated Exclusivity**

FCC rule requiring cable system operators carrying "distant signals" (i.e., television broadcast signals of non-local, out-of-market stations) to blackout out syndicated programming for which a local broadcast station owns the exclusive rights. Congress, in legislation signed into law in 1999 as the Satellite Home Viewer Improvement Act (SHVIA) directed the FCC to apply the same rule to DBS satellite retransmission of superstation signals. (See SHVA/SHVIA.)

**Sysadmin**

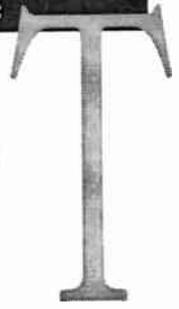
Short for "system administrator," the term refers to the individual in charge of a computer system (usually a network server or cluster of servers). Activities performed by a system administrator include monitoring security configurations, managing allocation of user names and passwords, monitoring disk space and other resource use, performing backups, and setting up new hardware and software. (See SYSOP)

**SYSOP - System Operator**

An abbreviation for a person responsible for operating a computer system or network and/or a private bulletin board system on the computer network. Sometimes used to describe the moderator of an electronic newsgroup. (See Sysadmin)

**System**

A very broad term to describe an organized communications environment in which information, communications signals, and related computer and electronic devices are interconnected in a cohesive architecture to meet business, industry, government, educational, or other information objectives. Systems can be generic or user-specific and used to interconnect computers, telephones, satellites, broadcast, microwave, cable, VSAT, and related distributive network equipment all in one infrastructure or separately in many different architectures.

**T-1**

Refers specifically to a type of telephone service over a network line able to carry digital traffic at 1.544 Mbps. T-1 lines are commonly used as leased lines for carrying voice-grade digital signals over traditional copper twisted-pair networks.

**T-3**

Refers specifically to a type of telephone service over a network line able to carry digital traffic at 45 Mbps. Due to its relatively large bandwidth capacity, T-3 lines are used for transmitting compressed video signals.

**T-Carrier**

Telephone industry transmission standards for digital circuits using Time Division Multiplexing techniques to carry multiple voice-grade channels. T-carrier classes refer to the number of voice channels that can be carried simultaneously.

**Table 42****T-Carrier Classes**

Class	# of Channels	Data Rate/ Channel	Data Rate/ Line
T-1	24 Channels	56 Kbps	1.544 Mbps
Fractional T-1	6 Channel Increments	56 Kbps	1.544 Mbps
T-3	672 Channels	56 Kbps	45 Mbps

*Source: Telephone Industry*

**TA - Terminal Adapter**

A small electronic adapter unit used to convert ISDN lines to standard phone lines or vice versa. (See ISDN)

**Table**

Refers to information that is arranged in rows and columns, most typically in relational databases and spreadsheet software applications. (See Flat File Database, Relational Database)

**Tandem Office**

A type of central office that serves as a relay to forward a call from one central office switch to the next. A tandem office only connects to other local central offices (CO) or Interexchange Carrier offices (IXC). It does not provide a direct connection to customer premise equipment. (See CO, CPE, IXC)

**Tariff**

In telephone and other common carrier communications such as satellites, a tariff is an established schedule of fees charged for access or use of certain equipment or services. Tariffs have to be approved by the Federal Communications Commission (FCC) before they can be put into effect.

**Taxware**

A software program developed by Taxware International that provides detailed tax rate information to commerce servers over the Internet.

**TBC - Timebase Corrector**

An electronic timing or clocking device used with video production and transmission operations to correct inconsistent timing in various signals. Timebase correctors are used to synchronize

**TCP/IP - TDMA**

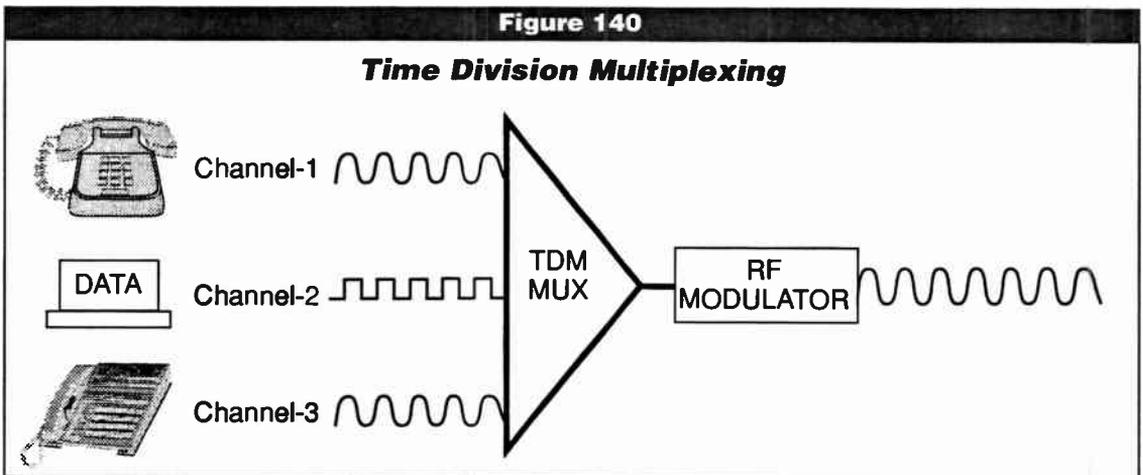
signals or reestablished synchronization. Due to the rise in computer-based video applications, video capture board cards are being made to provide a timebase corrector function. (See Video Capture Board)

**TCP/IP - Transmission Control Protocol/Internet Protocol**

The Internet Protocol (IP) is the standard set of rules used for transporting data on the Internet from one node to another. TCP, or Transmission Control Protocol, is a common convention used for verifying that the data being transmitted using the IP protocol has been transported correctly to a designated address or location. (See Internet, Node, Protocols)

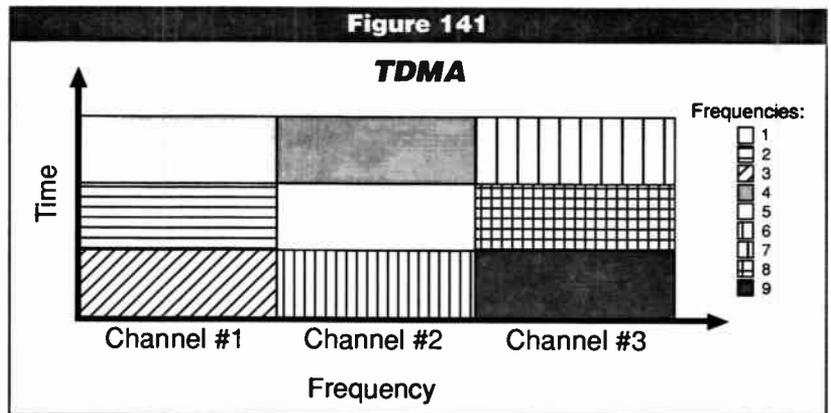
**TDM - Time Division Multiplexing**

A multiplexing technique to allocate parts of a digital signal to certain specified time slots enabling a number of different signals to be transmitted simultaneously. TDM is used by telephone and satellite carriers to transmit multiple voice, video, or data signals on a single line or channel. Digital bits are assigned to time slots in a single transmission stream so that voice, data, video or other information is interspersed as time coded signals and transmitted simultaneously. Demuxing is done at the receiving end to restore individual signals to their original form.



**TDMA - Time Division Multiple Access**

A digital communications multiplexing system used in various digital communications systems (e.g., satellites, cellular, PCS) which divides data signals into time segments for efficient transmission over finite spectrum resources. TDMA protocols boost carrying capacity and enable operators to provide other enhanced services. Alternative technical protocols include FDMA, CDMA and GSM.



**Technobabble**

Slang for "technical jargon," technobabble is characterized by excessive use of specialized acronyms, proprietary terms, and other phrases not widely known to the general public.

**Telco(s)**

A commonly-used U.S. abbreviation for telephone company(ies) that usually refers to companies providing local telephone services such as the RBOCs and their subsidiaries or local exchange carriers (LECs).

**Telecommunications**

An umbrella term that traditionally has referred to types of wireline-based telephony or telegraphy communications. In recent years, the term has become much broader encompassing computer data networks, on-line networks, video and audio systems, and most other forms of communication via electronic means.

**Telecommunications Act of 1996**

Major U.S. telecommunications reform legislation updating, revising, and deregulating many provisions of the Communications Act of 1934, and addressing many new areas of advancing technology, was signed into law in early 1996. Encapsulated briefly below are major provisions of the Act:

- Local telephone companies are permitted to provide long-distance telephone services with entry into the market to be determined on a case-by-case basis by the FCC.
- Long-distance telephone companies are permitted to offer competitive local phone services.
- The allowable reach of any single over-the-air television broadcasting entity has been raised to a maximum of 35% of the total U.S. viewing population.
- Radio national ownership limits were eliminated and local radio multiple ownership opportunities expanded.
- Cable rates have been deregulated in small markets, and will be determined largely according to what the market will bear. Competition will be allowed in 3 years.
- Cross-ownership rules between cable and telecommunications companies have been eased.
- Allocation of spectrum for ATV services will be provided to existing television broadcasters.
- Prohibitions have been imposed against transmitting indecent materials via on-line systems including the Internet without restricting access to minors.

**Telecommuting**

A growing workforce concept for working on job tasks remotely - usually from home - as a result of the growing availability of telecommunications technology and computer technology for home installation. Office workers from laboratory scientist, to sales force personnel are able to do office work at home on a part-time to full-time basis. Network systems and software access technology are becoming widely available enabling telecommuters to connect directly to main office LAN networks. Communications via email, audio, and more often video calling, allow for interaction with colleagues in the office or those telecommuting from their own remote home sites either via the office LAN network or dial-up lines from across the country. As traffic in major cities increases drive times to and from offices, telecommuting becomes an increasing attractive corporate benefit option for attracting and retaining high-level knowledge workers as employees.

**Teleconference - Teraflops****Teleconference**

A telephone or network-based audio conferencing call between two or more users. If video communications are involved the more accurate reference is "videoconference." (See CU-SeeMe, NetMeeting, Videoconferencing)

**Teledesic**

A Washington, DC-based satellite firm in the process of building a global broadband Ka-band satellite system to offer two-way, high-speed services and being promoted as the "Internet-in-the-Sky."

**Telephony**

Relates to the process of transmitting voice communications using a range of methods or means including wire, satellite, microwave, fiber or other mediums.

**Teleport**

A major satellite uplinking and downlinking facility that is often operated as a private business to provide telecom, data, video and other communication connections typically in major urban metropolitan areas. Teleports are centralized locations for the installation of many satellite antennas that cannot be located at business premises for a variety of zoning, economic, physical space, safety or other reasons. Often they offer clients convenient interconnection services via microwave, landline, cable and fiber lines in addition to satellite facility support services.

**Teletext**

Refers to transmitting text-based services as part of a standard television broadcast signal by inserting the information in the Vertical Blanking Interval. Closed-captioning is a form of teletext information transmitted to users. (See VBI)

**TELNET - TELEcommunications NETWORK**

Refers to the process of connecting one computer directly to another computer on the Internet (also known as a "remote login"). When users are initiating a remote login or "telnet session" they are literally establishing a long-distance connection with another computer on the Internet. These connections usually require authentication (user name and password). Telnet capabilities are built into Windows operating systems. (See Authentication, Login, Password, PIN)

**Telstar**

The first privately built and operated commercial U.S. domestic satellite (domsat) launched in 1962. Telstar was a joint venture between NASA and AT&T and the first active relay satellite for public telephone communications.

**Template**

An established pattern that acts as a guide by which materials, products, and documents are identically created. As applied in computer networking, a template is a technical protocol guide by which all computers or devices in the network will follow.

**Terabit**

One trillion digital bits expressed as  $10^{12}$  or 1,000,000,000,000 bits. (See Bits)

**Teraflops**

A measurement of computer processing speed where a "flop" refers to a single floating point instruction. A computer able to process one teraflop would process  $10^{12}$  or a trillion instructions per second.

**Terminal**

Forming the end, extremity, or terminus of a computer or telecommunication network. A terminal is end point device or connecting device in a network that can receive, manipulate, and send information. A typical terminal consists of a monitor and a keyboard as long as they are connected to a network. (See Network)

**Terminal Emulation**

A computer software program enabling a computer to act like a terminal to interconnect other computers to the network and communicate with a server. (See vt100)

**Terminal Server**

Computer on a Local Area Network (LAN) used to connect other computers to the network. A terminal server enables several computers to be attached to a network without having to directly connect each computer to the network. It basically acts as a server allowing access to other computer terminals to connect with a network.

**Terminator**

A computer device placed at an end point in a computer network to indicate a terminus to avoid possible feedback looping. Terminator devices must have the same resistance (measured in Ohms) as the transport medium, usually a 50 or 75 Ohm coaxial cable.

**Terrestrial**

A descriptive term referring to ground or earth-based communication networks, equipment, or facilities, and to communication distribution systems such as broadcasting and microwave operations that propagate over the surface of the earth.

**Text File**

A text file is a stripped word processing file or document reduced to simple text characters only. In text file form, a document can be transferred via the Internet or other on-line services, as well as copied into any word processing program. Text file formatting does not recognize apostrophes or other non-text characters.

**TFT - Thin Film Transistor**

A type of transistor circuit used in active matrix LCDs (liquid crystal display) that are being used to produce displays up to 14-inches in diagonal screen size. TFTs are used to turn LCD display elements on or off, and sometimes are called TFT-LCDs. The technology has promise for the development of future wall-screen TV displays and for HDTV sets.

**Thermal Mapping**

A remote sensing technique that uses satellite-based sensors to measure emitted electromagnetic radiation in spectrum bands that are not within the visible light portion of the spectrum. Essentially, the detectors are able to measure the relative coolness or warmth of earth features and then assigned color tones to these values in processing the data. Thermal mapping can be useful for geologic mapping (minerals), vegetation classification, vegetation stress detection, soil moisture content, wild fire management, thermal pollution and ocean current studies. (See GIS, Remote Sensing.)

**Thinnet**

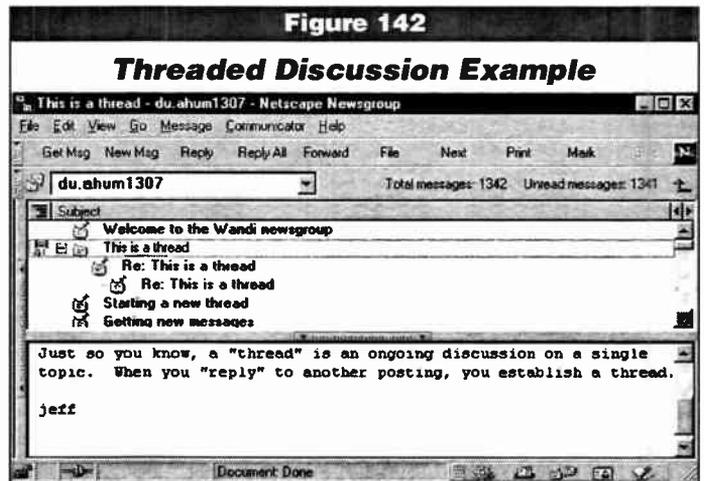
Refers to a commonly used physical transmission medium for Ethernet LAN systems consisting of a relatively thin 50-Ohm coaxial cable.

## Threaded Discussion - Time Shift

### Threaded Discussion

Refers to a more or less continuous chain of messages sent via email or posted to a discussion group that are all related to the same topic.

Typically, when a threaded discussion is being displayed, each reply to the original message is indented to indicate that it is a direct response to the message listed above it. Once someone posts a new topic, the potential for a new thread is created (if no one replies directly to that new topic, it's known as a "dead thread." (See Computer-Mediated Communication, Forum, Newsgroups, Usenet)



Source: NAB

### Throughput

A reference to network system transmission or computing capacity that indicates how much information can be transported or processed at any given time. Systems are judged to some extent on the maximum expected throughput of the system, or the maximum amount of data that may be transferred at any given time.

### Tie Line

A telephone industry term for lines used as a dedicated connection between two switching systems. Also called tie trunks, tie lines allow two PBX systems to be connected without having to access any outside network lines. Tie lines usually have a per-month cost charged to a subscriber.

### TIFF - Tag Image File Format

A common computer graphical format used for storing and exchanging digital image data.

### Time Code

In video and television productions, a time code stamp is inserted onto each individual frame of video to be used as a reference guide to assist in locating sections or segments of video. Television signals carry time codes in the Vertical Blanking Interval. (See VBI)

### Time Code Generator

Electronic device for inserting time codes onto videotapes or other recording materials. A time code almost always is inserted onto a blank video or audio tape prior to recording a program, or can be generated during the taping of the program. A VCR tape can be fast-forwarded to any point, but if the time code generator is set to 0:00:00 the tape will be imprinted at that point as the beginning start time.

### Time Division Multiplexing

A digital communication multiplexing technique based on precision time sequencing. (See TDM, TDMA)

### Time Shift

Originally introduced to the masses via the VCR, the term refers to a program, usually audio or

video, or an event that users can view at a time other than when it is broadcast or transmitted (at the user's convenience). Similar to on-demand services where users can "time-shift" a program to their convenience by storing the program in a Personal Video Recorder for use at a later time. New Internet programs allow users to make their own program guide, which allows them to "time-shift" programs at their convenience. In traditional TV or radio, the station was in control; with the Internet and with Webcasting, the user, visitor, viewer or listener can schedule programs in any order, at anytime. This results in "time-shifting" programs for convenience.

**Token Ring**

A type of Local Area Network (LAN) where a nominal perfunctory (i.e., token) frame of digital data must be received by an attached computer terminal or workstation before the workstation can begin transmitting information over the ring network.

**Toll Office**

Class of telephone central office that is the bridge between local and long distance switching. If a caller dials a phone number requiring an area code, the local telephone central office determines that the call needs to be sent to another area thus switching the call to a toll office (and incurring a toll charge) for hook up with a long-distance company or operator.

**Topology**

Refers to the configuration, architecture or physical layout of a telecommunication, cable, or other landline system. Some common network topologies are a ring and star. (See Star Topology).

**Touch Screen**

A type of video monitor designed to receive user input data by light touches to the screen surface. Touch screens often are used in menu-driven video information kiosk systems where users are able to obtain information by moving through various menus by touching appropriate segments or places indicated on the screen.

**Touchpad**

Similar in function to a mouse, a touchpad is a stationary computer "pointing device" used primarily on laptop computers to enable the user to move the pointer around the screen. Touchpads typically are small, flat surfaces positioned just below a laptop's keyboard. The touchpad enables users to press and slide a finger over the pad in order to direct and move the on-screen pointer. In certain units, the equivalent of mouse clicks can be achieved by gently tapping the pad. Some users find touchpads difficult to manage compared to a traditional mouse. (See Trackball)

**Trackball**

A trackball works like a traditional mouse lying on its back – to move the pointer on the computer screen users rotate the ball with their thumb, fingers, or palm. One of the most convenient characteristics of trackballs can be used on any surface, including a user's lap. (See Touchpad)

**Traffic**

A measure of the amount of signal information transmitted over a wired or wireless telecommunications network or system at a given point in time. (See Traffic Engineering)

**Traffic Engineering**

Network engineering functions involving the design of telecommunications networks to manage

**Transceiver - Transport Layer**

traffic or throughput demand under various conditions including various techniques or capabilities to route information in the most efficient manner. Determinations are made regarding upgrading strategies or rerouting of traffic using backbone technologies like ATM. Using ATM solutions, system storage buffers can be installed in major nodes to temporarily hold information until pathways are cleared, or data is rerouted to another less crowded part of the network.

**Transceiver**

An electronic device combining two functions — transmitting and receiving — in the same equipment. Cellular phones, and some new PDAs such as Motorola's Envoy are examples of mobile transceivers able to both send and receive messaging, paging and voice signals.

**Transformer**

An electromagnetic device for changing the voltage of an AC power supply, physically isolating different currents in a system, convert time varying signals from one level to another. Transformers are widely used in electronics and basically operate by using separate coils of wire wound around a magnetic core to induce generation of an electric current. One coil is considered primary and the other secondary, with the amount of electric signal induced by the flow of current into the secondary unit determined by engineering design. Large utility power transformers can be 20 feet tall whereas RF signal transformers can be smaller than one-half square inch.

**Transistor**

A semiconductor device in which the output current can be controlled by the signal applied to it from one or more input terminals and is regarded as type of current amplifier. Transistors are commonly used in computing system motherboards and microprocessors. (See CPU, Microprocessor, Motherboard)

**Transmission**

The act of sending or transporting electronic signals from one point or terminus to another via a range of mediums and techniques. Signal transmissions are carried over physical wire, cable, optical glass or plastic fiber, or other physical lines; or transported via radio frequency based systems using a wide range of electromagnetic spectrum resources for broadcasting, microwave, MMDS, wireless cellular, PCS, satellite, and other wireless mobile services.

**Transparent Mode**

Refers to certain parts of the addressing, grouping, and transmission of a signal information, which cannot be seen by users. The Open Systems Interconnect (OSI) model describes seven levels of functionality in a network. The layers range from a user's transmit command to reception of the information on a receiver's computer screen. In the OSI model, only the Application, or first layer, can be observed or viewed by a user. All other levels are considered to be in transparent mode as the functions are performed out-of-viewing sight without further user input. (See Clear Channel, OSI)

**Transponder**

Electronic devices used primarily in satellite communications which combine the functions of transmitter, receiver and amplifier and are used for receiving uplinked signals, and downlinking or transmitting communication signals on specified frequency channels.

**Transport Layer**

The fourth layer in the seven-layer open system integration model used for digital communications networks. (See OSI)

**Trigger**

An action that occurs when some pre-specified condition or conditions are met. For example, in some word processing software applications, pressing the combination of CTRL + S on the computer keyboard triggers an instruction to be processed that saves the current word processed document. (See GPI Trigger)

**Trojan Horse**

Used by hackers to invade or destroy computer systems, it refers to the process of sending to a computer malicious programs that are disguised as harmless programs. Once the Trojan horse program is allowed to run on the targeted computer, it can do everything from installing software that the hackers will use later to installing viruses that destroy data on the system. One of the most common Trojan horse vulnerabilities now shows up in the form of email attachments promising to rid your personal computer of viruses; however, when users open the attached file their computer is actually infected with viruses. (See Anti-Virus Software, Attachment, E-mail Attachment, Hacker, Virus)

**True Color**

Refers to graphic devices or software what allows for more than 16 million unique colors to be displayed on a computer screen, which is far more colors than the human eye can distinguish.

**Trunk Line**

A central transport line connecting a number of auxiliary network lines used in telecommunications, cable television, computer, and data systems. In business telephony and computer systems, trunk lines are "dedicated lines" commonly used for inter-office communications when direct access is required. Such trunk lines only can be used to communicate from office to office. Use of an area code or prefix usually is unnecessary. The number of transmissions at any given time is limited to the number of trunk lines available unless calls are multiplexed, allowing multiple calls to be carried on a single line. (See Multiplexing, VPN)

**Tuner**

An electronic device used for selecting a certain band of frequencies for reception and/or demodulation. Radio and television sets are designed to receive multiple signals but set tuners can receive only one signal at a time. Frequency tuners adjust the reception frequency according to input from a viewer/listener via infrared remote control devices or a mechanical knob on the radio receiver or TV set.

**Turnkey**

A turnkey system is designed to perform certain specified functions for a client/customer, and is purchased as a package where equipment and software is completely installed, checked out and ready to run before the buyer takes custody of the system. A turnkey computer system is in contrast to a consumer purchasing a PC, several pieces of software, video card, fax modem, etc., and then fashioning a workable home computer system. Turnkey means delivering a complete, up and running system, and if it does not work properly in any way the vendor is responsible to fix it.

**TV - Television**

Refers to a system of terrestrial television broadcasting which, in the U.S., is provided free over-the-air by over 1,220 commercial television stations and four commercial networks, complemented by 370 public broadcasting stations. The advertiser-supported commercial television industry provides video entertainment, news, sports, special event, cultural, and children's programming, and public stations added their own educational, instructional, entertainment and other programming to the 98.8% of households with televisions.

**TVDS - Two-Way****TVDS - Television Data System**

Television Data System is a new technology that uses extra data capacity available in the Closed Captioning (CC) system to transmit program identification and other information to a home TV receiver. The data is transmitted in the vertical blanking interval of the TV signal along with the captioning data. Once received, this information could be stored in the receivers' memory and displayed on demand by the consumer. The data could be used to send a station's call sign, upcoming program schedule, and emergency alert information. It also could be used to program a VCR.

**TVPCs/PCTVs**

TVPCs refer to the hypothetical merging of current/future television sets with some level of computer functionality. Such units would permit users to intermingle television viewing along with such activities as Internet surfing or computer game playing. Coming from the opposite direction, PCTVs are viewed as hybrid electronic products in which PCs would include functions of a traditional television set. Such hybrid units would have PCTV tuner cards, along with port connections for an outdoor antenna, satellite dish, or coaxial cable feed. Hybrid PCTVs would receive and display transmitted television signals at the same quality level as HDTV sets, as well as provide traditional PC functionality. The jury in terms of consumer demand is still out on either version. Although the exchange of certain functions is more likely to occur if consumer-priced flat panel display screens emerge simultaneously, allowing the display screen to be logically separated from all other hardware functions. (See Flat Panel Display)

**TVRO - Television Receive Only**

Refers to satellite antenna equipment or systems used for reception of video television and cable programming services. TVROs are associated with the large 4-6 foot C-band backyard dishes used in the 1980s to early 1990s for receiving cable and distant signal TV superstations by home consumers. In the U.S., use of TVROs declined rapidly with the introduction of Ku-band DBS / DTH services. TVRO antennas remain a staple of the VSAT business-to-business market. (See DBS, VSAT.)

**Tweening**

Short for "in-betweening," it refers to the process of creating progressive frames between two images to make it look as if the first image is moving across the screen or gradually "morphing" into the second image. Tweening allows animators to draw only two images and then let the computer do the work to fill in the blanks in between, which makes for much more efficient, smooth animation. (See Morphing)

**Twisted-Pair (TP)**

A standard pair of copper wires used by the telephone industry for voice telephone or data network transmissions. Twisted-pair lines are almost universally installed as residential phone lines in the U.S., thus telephone companies have an enormous installed base of copper wire facilities that physically or financially cannot be easily or quickly replaced to provide new upgraded interactive or other broadband services. Twisted-pair lines are grouped into a larger casing of 25 - 50 pairs, and individual wire pairs are twisted together to negate any magnetic interference caused by an adjacent wire pair.

**Two-way**

Also referred to as "full-duplex" communications, two-way communications facilities whether wired or wireless (i.e., RF-based), provide the capability to perform simultaneous interactivity where a receiver and sender can respond immediately to each other.

**UART – Universal Asynchronous Receiver/Transmitter**

An integrated circuit, or microchip, UART is a generic term for a device that performs the conversion from parallel processing to a single stream of data for serial transmission. Essentially, a UART is the part of a modem that completes the conversion between phone lines and the internal bus structure of a computer.

**UHF – Ultra High Frequency**

The portion of the radio frequency spectrum ranging between 300 MHz and 3 GHz. The UHF band is used for transmission of television broadcast channels 14 - 67; previously allocated television channels 68 - 83 have been reassigned for use as cellular telephone services, except for a few special cases. (See Spectrum)

**Underscanning**

A technique used in video production to compensate for different amounts of display area on various television set models. Not all television picture tubes conform to the same size display area, and display tubes also deteriorate with age, reducing image area or size. Broadcast television sets often are built to minimum specification. As a result, to compensate for the possible lack of visibility of the outer 10% of a broadcast picture, video producers underscan, or discount, this outer image portion when producing programs. Certain television sets even have a scan control adjustment to enlarge a picture image to eliminate the 10% of video information located on the fringe of the screen. The boundary for “safe titles” — the safety zone within which text titles can be displayed without fear of being cut-out or blocked from view — is even further reduced (10% more) to ensure that all titles will be displayed on any set.

**UNI – User Network Interface**

A telephone industry protocol used to define the point at which the private subscriber and the public network meet. This protocol includes such items as signaling, addressing, and traffic management.

**Unicode**

A standard for representing characters as numbers, Unicode can be used to represent more than 65,000 unique characters, which makes it suitable for languages such as Chinese, Japanese, and Greek. Unicode is much more flexible than ASCII, so it is generally assumed that as the computing world becomes more global, Unicode will replace ASCII as the “universal language” of computing. (See ASCII)

**Unique User**

The number of different individuals who visit a website or page within a specific period of time. (See Hit)

**Universal Remote**

A “universal” remote is a consumer remote control unit, which can be programmed to operate a variety of electronic systems or devices including televisions, VCRs, stereos, CD-ROMs, and other electronics equipment produced by a wide range of manufacturers.

**UNIX**

Unix is a multi-tasking multi-user operating system, and is currently the most popular operating system found on multi-user installations. Most Internet servers run on Unix systems. Unix is based on collection of small, easily understood utilities that allow users to connect them in many different ways (and in ways that the creators of Unix did not predict), building procedures and

## Uplink - USB

sophisticated tasks to suit special needs. This “Unix philosophy” is often contrasted with the more tightly controlled programming environments (such as Microsoft Windows NT, IBM mainframe, and Macintosh operating systems) in which users can only perform tasks the system designers could predict. (See Case Sensitivity, Linux, Open Source)

### Uplink

The ability and process of transmitting communication signals to satellite space segments from a ground-based earth station facility. Uplink frequencies differ for various types of communication services and are separate from the frequencies used to downlink signals from the same satellite. To permit frequency reuse to increase spectrum efficiency, domestic C-band and Ku-band satellites are assigned orbital arc positions in geostationary orbit spaced  $2^\circ$  apart, and high power DBS satellites are spaced  $9^\circ$  apart.

### Upload

To transmit a file from one source to another source, usually from one computer to another.

### UPS – Uninterruptible Power Supply

Refers to a battery-powered device designed to provide constant power to mission-critical computing systems during interruptions in electrical service.

### Uptime

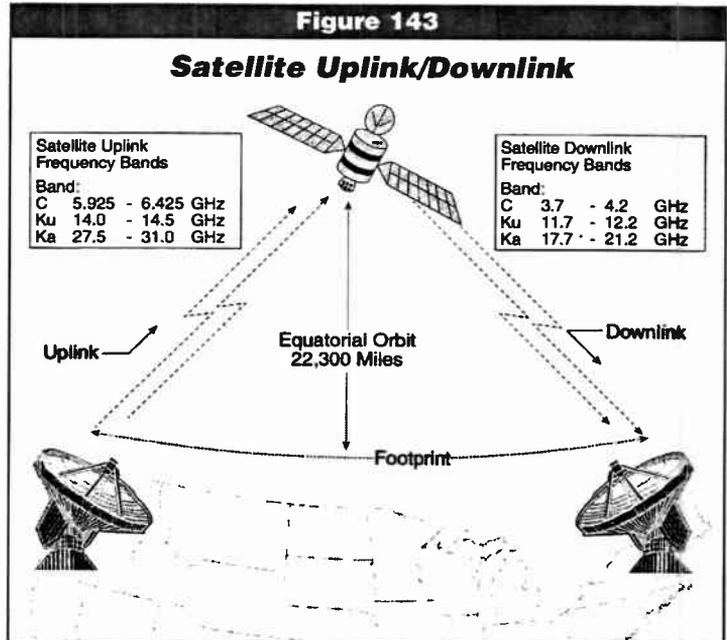
Refers to the amount of uninterrupted time that a computer, system, or network is operational, that is, running or up, available and working correctly. Uptime is the time between failures. Hardware equipment specifications often promote and state an average uptime with longer average uptimes suggesting more reliable equipment.

### URL – Uniform Resource Locator

(See Figure 145 on next page) Internet references for the “de facto” standardized way of locating files, documents, or network services on the World Wide Web. URLs consists of four parts: the protocol type, the machine name, the directory path and the file name. For example: <http://www.matisse.net/seminars.html>. (See HTTP)

### USB – Universal Serial Bus

USB brings a new level of “plug-and-play” ability to computers by allowing users to connect external devices such as printers, scanners, cameras, and external drives to a PC via a USB connection. This approach greatly reduces the need to install special cards into dedicated computer slots that then require users to reconfigure the computer system. Personal computers equipped with USB allow computer peripherals to be automatically configured as soon as they



Source: Wireless Networked Communications

are physically attached - without the need to reboot or run a special setup or installation program. USB also allows users to connect multiple devices - up to 127 - to run simultaneously on a single computer. USB has been available in the Macintosh environment for many years, and made its way into the PC world with the introduction of Windows 95. USB is becoming more and more widely supported every year. (See Plug 'n Play, Install/Uninstall)

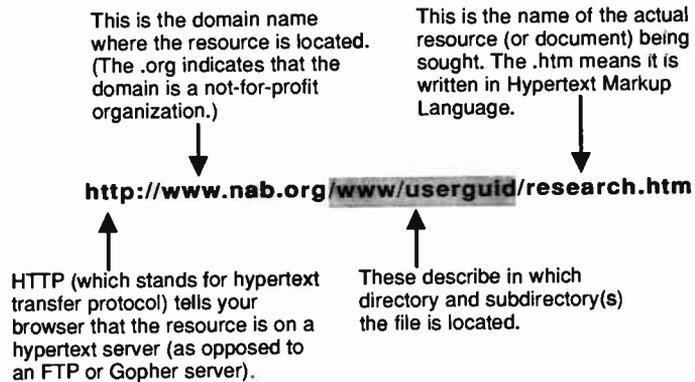
Figure 144

### Understanding URLs

*"A rose is a rose is a rose is a www.rose.com"*

A Uniform Resource Locator (URL) describes the physical location of a document, or resource, on the World Wide Web. Each element of a URL is important, telling a Web browser exactly what document to request, and where to look for it.

As an example, the NAB Research & Planning Department page can be found at the URL below:



Source: NAB

### Usenet

Usenet is an array of global networks connected together via Usenet server machines to exchange news or information in informal groups which individuals join or leave as they choose. It is a global on-line system consisting of 50,000+ discussion groups (i.e., newsgroups) and it is completely decentralized. Similar to bulletin board systems, groups tend to be focused on specific areas of interest with topics ranging from dedicated fans of a particular television show to scientists studying nuclear particle physics. (See Discussion Group, Newsgroup, Threaded Discussion)

### User ID

A type of security password often used in business and other computer networks to allow access to the system. Users are assigned a unique combination of letters/numbers as an identifier to preclude easy access by unauthorized users.

### User Interface

Refers to the part or parts of any computer system that a user employs or uses to interact with the system to direct or command it to perform some task. Recent user interface systems, for example, can be combinations of hardware (monitor) and software (Windows, or other graphical interface program) which provide a user-friendly working environment, allowing most computer functions to be transparent to user. (See GUI)

### User-Friendly

A term generally referring to how easy a particular software or hardware design is for use by an average individual. Apple's Macintosh computer became very popular based on its ability to be highly user-friendly. First-time users could quickly feel comfortable using a Macintosh with very little training due to its intuitive graphical interface that allowed users to follow along logically and perform many common functions such as opening up software files to installing new software applications.

**UTC - UUencode/UUdecode****UTC - Universal Time Code**

A more precise term for Greenwich Mean Time; UTC is the standard time by which all clocks and time zones are referenced. (See GMT)

**UUencode/UUdecode**

A common coding scheme or transfer protocol accepted as a worldwide standard for data transmitted via e-mail or over the Internet. UUencode/UUdecode translates data files from computer machine binary language to ASCII; the process does not distort data information thus allowing any computer system to decipher received messages.

**V.90**

The technical interface standard adopted by computer industry manufacturers that enables computer users to connect a modem to other computers at the digital bit rate of 56 kbps. This standard is most commonly used to connect dial-up users to an Internet Service Provider. (See Modem)

**V-Band**

The V-Band is a specific designated segment of the electromagnetic spectrum ranging from about 35 – 45 GHz. This portion of the RF spectrum is of increasing interest to certain parties particularly satellite and fixed wireless services. Satellite companies including TRW, Hughes Communications, Lockheed Martin and Teledesic are seeking to block efforts by the fixed wireless industry to gain increased use of the V-band spectrum which otherwise could be used for new satellite services. The V-band is attractive for future high-bandwidth communications gateway services (i.e., with digital transmission rates of more than 100 Mbps). V-band spectrum is capable of supporting satellite digital transmission rates that are roughly 10 times more than those of Ka-band satellite systems currently under development. Objections have been filed with the FCC to oppose a plan to be presented at the ITU's World Radio Conference (WRC-2000) in May 2000. The proposal would reduce allowable satellite transmission power to a level below that which is required to support satellite gateway and other satellite operations in a large portion of the V-Band between 37.5 - 42.5 GHz.

Fixed wireless services companies advocate reduced satellite power levels for a number of reasons. Primarily, high power levels could impact the terrestrial high-speed broadband Internet access and data transport services these wireless companies are seeking to provide in the future, as well as any local and long distance phone services they offer. On the other side, the Satellite Industry Association (SIA) states that "the limits the terrestrial wireless industry are proposing could harm the deployment of global satellite systems in the V-band." Roughly a dozen satellite companies have applied to use the V-band to provide broadband services to consumers and businesses. The V-band is the next step on that spectrum ladder for the satellite industry, and has been allocated globally for use by satellite operators. The ability of other global satellite systems to provide worldwide services may be jeopardized by a conflicting proposal supported the U.S.

**V-Chip**

Refers to the system that reads information encoded in a rated television program and blocks programs from the set based upon the rating selected by the parent. Pursuant to FCC rules, half of all new television models 13 inches or larger manufactured after July 1, 1999, and all sets 13 inches or larger manufactured after January 1, 2000 must have V-Chip technology. Set top boxes, which allow consumers to use V-Chip technology on their existing sets, are now available.

**Value Added Network (VAN)**

A general reference describing a network system that, when installed or operational, adds business, productivity, technical efficiency or some other intrinsic value to an information network. Basic data transmission networks used by business or public users such as those providing e-mail or Internet services are considered value-added networks. In telephony, if a phone company accesses a computer database network for routing information based on previous calling patterns this a business VAN.

**Vaporware**

A derogatory term that refers to the tendency on the part of some software development companies to announce the existence of computer software applications before they functionally exist, or to announce release dates for software and then continually delay release of the product.

**VBI - VCR****VBI - Vertical Blanking Interval**

Refers to an interim period in broadcast television signaling that corresponds to the time it takes for the electron gun in a television set to travel vertically back to the top of the screen in order to begin scanning or tracing a new video field onto the tube screen. Within the VBI time interval, video scan lines are used to carry a variety of information such as time codes to ensure correct synchronization of the picture, along with other text information services such as closed-captioning. VBI lines are not viewable without a special closed caption decoder but may be seen as the black bordering portions of a regular TV screen located at the very top and very bottom of the screen.

Figure 145

**VBI - Vertical Blanking Interval**

Lines	Information
1-3	Pre-Equalizing Pulses
4-6	Vertical Serrations
7-9	Post-Equalizing Pulses
10-12	Unassigned
13 and 15	VITC Time Code
14	VIMAC
16-18	Unassigned
19	5-Step Modulated VIRS
20	NTC-7 Composite/Comb
21	Closed Captioning and Parental Control (V-Chip)



Video Signals are transmitted at 30 frames per second with 2 vertical scans per frame = 60 vertical scans per second.

FCC rules allow data transmission (including closed-captioning) to be transmitted in the VBI lines between "active" lines of video picture material.

Source: NAB

**VCR - Video Cassette Recorder**

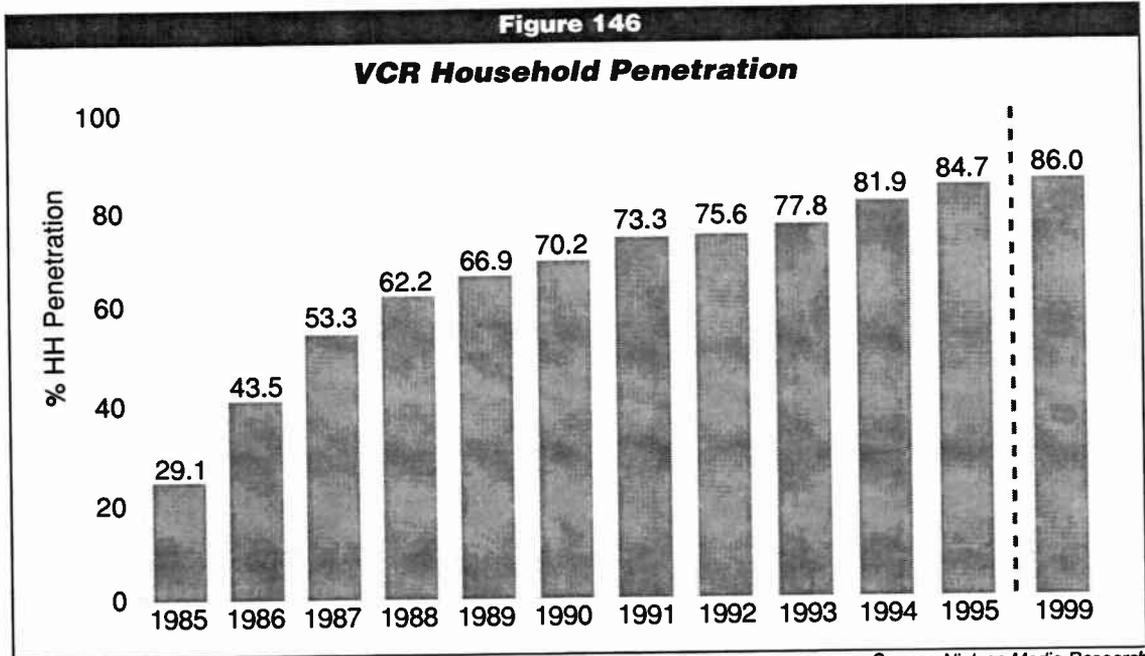
Consumer electronics equipment with magnetic recording and playback capabilities and used for recording off-air programming and for viewing home videotapes or videotape rentals. VCRs are common video electronic appliances with household penetration rates exceeding that of cable television.

Table 43

**VCR Decks***Sales to Dealers*

	Unit Sales (thousands)	Dollar Sales (millions)	Average Unit Price
1994	13,087	\$2,869	\$218
1995	13,562	\$2,767	\$204
1996	15,641	\$2,815	\$180
1997	16,673	\$2,618	\$157
1998	18,113	\$2,408	\$133
1999 proj.	17,650	\$2,259	\$128

Source: U.S. Consumer Electronics Industry Today -  
Consumer Electronics Manufacturers Association (CEMA)



### VDT - Video Display Terminal

Another name commonly used for computer monitors and refers to the display or viewing screen used with a computer system. VDTs allow users to view and, in some cases, interact physically with application programs in progress. (See CRT, Touch Screen)

### Vector Graphics

A drawing program that generates separate shapes such as lines, polygons and text as opposed to a painting program that stores images only as dots (or bitmaps). The advantage of vector graphics software is that it makes it possible to change any element in a picture image at any time, as each part of the image is stored as an independent object. Vector images can be resized, stretched and redrawn in many different ways. On the other hand, a bitmap must be changed one point or dot at a time, and changes are much

**Table 44**

#### **Popular Vector Graphics File Formats**

Vector Graphic Formats	Comments
CGM	<i>Computer Graphics Metafile</i> – Widely used on personal computers.
DXF	<i>Data Exchange File</i> – Commonly used by CAD systems.
EPS	<i>Encapsulated PostScript</i> – Developed by Adobe for the PostScript language.
IGES	<i>Initial Graphics Exchange Specification</i> – Used for three-dimensional models commonly produced by CAD systems.
PICT	A common format developed by Apple.
WMF	<i>Windows Metafile Format</i> – A file format for exchanging graphics among Microsoft Windows programs.

**Vectorscope - Video Codec**

more difficult to reverse or undo. Most sophisticated graphical programs use vector graphics technology due its flexibility and the image quality produced by the software. (See Flash)

**Vectorscope**

A device that measures the hue and saturation levels of color signals for broadcast television. A vectorscope allows technical personnel to know whether to adjust the colors of the video signal being broadcast by a television station or network.

**VGA - Video Graphics Array**

An early standard format for computer video monitors. (See Graphics Adapters)

**VHF - Very High Frequency**

A portion of the electromagnetic spectrum from 30 MHz - 300 MHz used for television broadcasting of channels 2-14, and for FM radio broadcasting. (See Spectrum)

**VHS - Video Home System**

The most popular consumer-oriented videotape format which has made it the 'de facto' standard for the consumer videotape market. VCR players use half-inch VHS magnetic tapes to record up to six hours of NTSC television. Image resolution of VHS playback is less than typical TV set display quality which has led to Super VHS (S-VHS) as an improved recording system that offers image quality that is essentially comparable to NTSC television on typical sets.

**Video**

An umbrella term often used to refer to television programming received via television broadcast stations. But video encompasses a broad range of applications, services, industries, and business. Among others: videotapes used for VCR recording and playback, video rentals of movies and related entertainment material, videotape and videodisc information for education, training, reference works, CD-ROM multimedia videos, video games in a range of formats, business video productions, business videoconferencing, and/or desktop video allowing some degree of motion video to be transmitted with audio signals for computer-based interactive conference meetings.

**Video Capture**

Refers to the process or action of capturing video signals for converting into formats that can be saved on computer hard disks or optical storage devices for later manipulation with video graphics or editing software.

**Video Capture Board**

An electronic circuit board in personal computers that functions to "capture" two fields of video information in memory and then compile them into a complete frame for progressive scanning display on the computer monitor. In order for NTSC video to be reproduced on a computer monitor, a complete video frame made up of two fields must be stored by a video capture board before the computer's progressive scanning process can occur. Progressive scanning, like its name, takes a complete video frame and scans it line by line in a progressive order. In comparison, frames of NTSC video are constructed through an interlacing process in which alternating video fields (or half-frames) are scanned onto a TV screen using every other line on each pass. (See Interlace Scanning, Progressive Scanning)

**Video Codec**

An electronic device that combines the functions of a video encoder and decoder in a single piece of equipment. Video codecs are used to convert analog video signal into digital code and/or decode the digital back into analog for viewing.

**Video Compression**

Refers to a growing range of sophisticated methods or techniques for reducing the amount of video material in a signal to save on transmission requirements (i.e., bandwidth, speed) or storage requirements (e.g., disk, memory capacity). Video compression is especially critical for digitized video materials such as television programs, movies and films, and particularly future HDTV broadcasting transmissions. Digital compression technologies include those that reduce the “redundancies” in digitized video signals so that more information can be squeezed or transmitted through a channel or pipeline at faster rates. Full-motion video such as NTSC television or multiple channels of feature films distributed over a cable system, telephone fiber optic networks, or satellite DTH/DBS services require enormous bandwidth capacity for transmission. Compression techniques are being developed or refined that will reduce spectrum and wireline bandwidth requirements, but at the same time do not lose the motion quality required in movies and especially fast-paced sports coverage.

**Videoconferencing**

A developing interactive video communications business where video and audio software and hardware enable multiple sites to interactively see and hear exchanges, participate in meeting discussions, or ask questions following business presentations. Technical standards for videoconferencing operations have been adopted by the CCITT. (See Application Sharing, CU-SeeMe, NetMeeting, Whiteboard)

**Video Disc**

Originally designed as “videographic” read-only digital discs for feature film movies with stereo sound to be played on new laser disc players. Marketing problems emerged with two competing, incompatible video disc players – optical laser vs. mechanical stylus. Optical laser videodiscs, interactive CD-ROMs, and a new generation of videodisc are beginning to gain consumer acceptance.

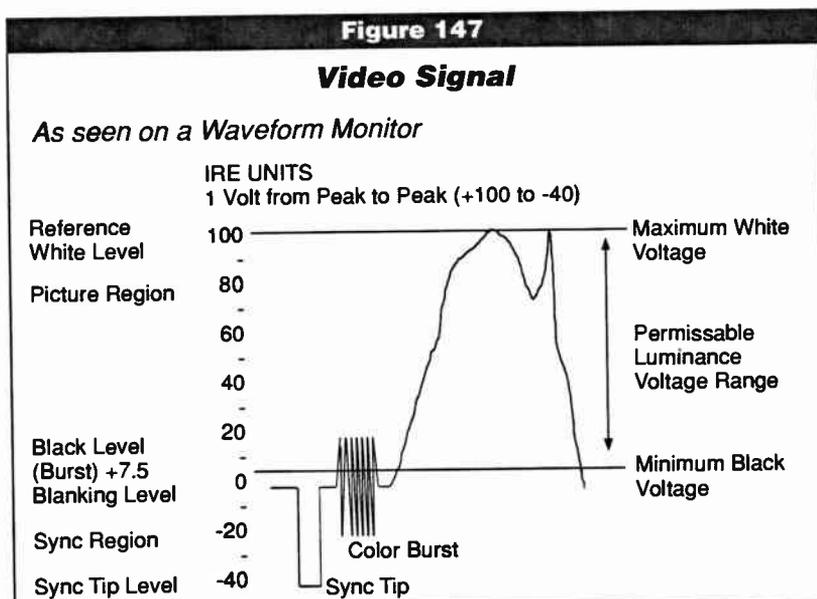
**Video Server**

A powerful computer-based server system suggested as the answer to true video-on-demand (VOD) services. Video servers would operate in a manner somewhat similar to a jukebox that would instantly respond to a VOD request.

Sufficient copies of video entertainment movies, PPV events, sport programming, and other programming would be stored on a network of video servers at some central location. Selected video programming would be transmitted to individual user locations on demand.

**Video Signal**

NTSC television video signals are composed of composite waveforms of horizontal video scan



Source: R. Yadon

**Video Stream - Virtual Circuit**

lines containing video picture information, along with a color signal, a reference color burst signal, and horizontal sync or blanking pulse. At the end of each scan line, there is a horizontal blanking pulse which drops the visual signal level to black, thus masking it from viewers during display. During this horizontal blanking interval (HBI), a reference color burst signal is generated. Such color bursts are needed because NTSC color or chrominance information is transmitted on a subcarrier signal and is modulated (i.e., varied in amplitude and phase) in reference to the color burst signal.

**Video Stream**

Refers to the flow or transmission of a digital video bitstream signal through a distribution line such as coaxial cable. For example, a video stream that is less than the DS-3 level of 45 Mbps would not be able to support television-quality video transmission over a network. A narrowband T-1 line video stream of 1.544 Mbps might be able to support VCR-quality video.

**Viewer**

A program, sometimes called a "player" to allow a file to be read (or played) but not changed. Viewers are often freely distributed even when the editor application is not. This allows users to create files with the editor and make the viewer available to other users so they can see the files. Examples include the Microsoft Word and Adobe Acrobat viewers (See Acrobat, PDF, Plug-in).

**Virtual**

Giving the appearance of reality through apparent or imitative functions or actions. The development of digital technology, artificial intelligence software, innovative graphical animation electronic systems, and high power computing have combined to allow product developers, Internet users, multimedia creators, and many others, to embark on the creation of virtual universes, virtual reality systems, virtual software, interfaces, to name a few promising fields.

**Virtual Channel (VC)**

A term used in telecommunications or computer networks using Asynchronous Transfer Mode (ATM) technology to define the portion of a network path that a data packet of a fixed-size must travel to get from sender to receiver. Analogous to broadband technology, where one transmission pathway can encompass a number of carrier frequencies or channels, a VC is contained within a Virtual Path. The pathway and channels are termed virtual because they are established for only one transaction and channel number is assigned arbitrarily by the computer. During actual transmission, the packet will be shifted or hopped from channel to channel as it passes through a switch. (See Switch, Virtual Path)

**Virtual Circuit**

A telecommunications link that appears to a user to be a dedicated point-to-point circuit, but it is not. Such circuits are set up on a per-call basis, and usually are disconnected after each use. There are two types of "virtual" circuits:

- Switched Circuits - Prompts the telecom system to create a virtual point-to-point service connection each time it is accessed for the transmission of information.
- Permanent Circuits - These are pre-determined paths or routes that are set up prior to any transmission occurring.

**Virtual Community**

A community of individuals who work together, or communicate together by the use of networks or the Internet. Communities can form from those who visit a specific website regularly, belong to the same associations and organizations, often listen to the same radio stations, watch the same television programs, or those who subscribe to e-mail lists. Typically, virtual communities provide an interactive experience among users who tend to form like interests, bond, and may start to communicate with others. (See Computer-Mediated Communication, Forum, Newsgroups, Threaded Discussion, Usenet)

**Virtual Path (VP)**

In telecommunications networks, virtual paths are collections of Virtual Channels (VCs). VPs are links or route set up from sender to receiver for the purpose of transmitting selected information. This connection is termed virtual, as the pathway is not a permanently hardwired circuit. VPs are established solely for the singular transfer of particular signal information. Multiple virtual paths can co-exist on a transmission line. (See ATM, Virtual Channel)

**Virtual Private Network (VPN)**

1. Refers to the use of software and hardware to create a private secure environment within a public non-secure environment. Typically used on the Internet to conduct secure business-to-business transactions or internal network communications. VPNs use encryption in the lower protocol layers to provide a secure connection through an otherwise insecure network such as the Internet. VPNs are generally cheaper than real telephone private networks using private lines, but for security they rely on having the same encryption system at both ends. Routers may perform the encryption security by firewall software or possibly. (See Protocols)
2. A type of telecommunication service in which the public switched telephone network provides basic routing and switching, but phone service subscribers are offered many of the features of a separate private network. Services available are transparent, meaning that a subscriber can utilize public network resources with the same, or more, flexibility as a facilities-based private network, without having the service delivered over a dedicated private line. VPN services are usually offered at lower rates than dedicated private lines because less cabling has to be strung from one office to the next.

**Virtual Reality (VR)**

Use of sophisticated video, audio, sensory, and other computer-based or generated applications to create a convincing "virtual" environment for a user. The technology is still in early development but eventually may have impacts in areas such as games and entertainment, teleconferencing, flight and other highly technical simulation training and educational learning simulations. The virtual environment is totally computer-based or created. VR systems, to some extent, create illusions designed to fool the human senses such as depth and motion perception with the use of electronic head-mounted visual display equipment, and sensory gloves for motion and other sensory input.

**Virtual Set**

Used in television news programs such as weather reporting or other programming such as talk shows, where the foreground or background is not a physical set but a graphical image overlaid or mapped into the on-air signal and appears to viewers like an actual physical set. In weather reporting, the weather map is a visual graphics file that appears to viewers as if the weathercaster

**Virtual Space - VOD**

is standing in front of the map during the report. Most virtual sets use a blue backdrop, a high-end graphical computer system to store virtual set files, and a high-end monitor to display the virtual set for the weathercaster during on-air broadcasts.

**Virtual Space**

Refers to the creation of an illusion of 2-D or 3-D space created by the use of microprocessors, computer memory, and telecommunications networks. The extensive environments that can be created with flight simulators and virtual reality systems are examples of virtual space.

**Virtual Walkthrough**

A software-based technique using virtual reality applications enabling a user to appear to "walk through" a physical environment that has been created by VRML or another software package such as Virtus VR. Virtual walkthroughs are being used to preview architectural designs before being built.

**Virus**

A malicious computer program designed to inflict some harm (lost information, corrupted computer programs, computer system damage, erroneous messages, etc.) on an infected computer system. Viruses require some kind of assistance to spread, usually they move via the exchange of floppy disks, via the downloading of computer files, or via electronic mail. Not all viruses are destructive, but most are time consuming and costly to remove. General rules for avoiding viruses include installing up-to-date Anti-Virus Software, not inserting floppy disks of unknown origin (especially if they've been used in public computing facilities), staying clear of Warez websites, and not opening email attachments that contain attached files that end in ".exe". (See Anti-Virus Software, Warez)

**Visible Light**

The portion of the electromagnetic spectrum that is visible to the human eye. Visible light has wavelengths of 400 to 700 nanometers (nm).

**Visit**

A single unit of measurement that encompasses all activity by a user to a specific website during a specified amount of time. If a user makes no requests from that site during a predetermined period of time (30 minutes is standard), the next hit would constitute the beginning of a new visit. A visit can contain several ad views. It is a way of trying to understand how many different people may be using a website, not just how many resources are being served to clients. One person might request 100 objects, generating lots of site traffic, another person may request only one HTML page. (See Click-Through Rate, Hit)

**VLSI - Very Large Scale Integration**

Manufacturing technology allowing the placement of hundreds of thousands of electronic transistors on a single semiconductor measuring one-quarter inch square. VLSI manufacturing typically refers to integrated circuit (IC) designs with 100,000 or more transistors.

**VOD - Video-on-Demand**

Refers to future interactive video distribution systems where user demands for viewing a selected video program, movies, or other interactive service could be responded to instantly by the system. Current capabilities only allow for time-delayed access to PPV movies, for example, 15-minute window start-times for about 5-10 different movie selections. In future VOD systems, which will entail construction of interconnected networks of video servers, user requests for movies or any

other programming event would be available in seconds. Selected VOD programming could be played instantly or started in a few minutes or few hours, and paused or rewind during playback similar to VCR operations. True VOD systems are projected to *begin* to become available in the 2005 - 2008 timeframe.

### Voice Activation/Recognition

Voice activation or recognition systems use electronic audio memory devices and software intelligence to be able to distinguish between various user voices in order to respond to spoken commands. Most commercial systems are still fairly rudimentary and require users to repeat a set of spoken words to "train" the recognition device to respond to commands. (See Speech Recognition)

### Voice Digitization

The process of converting an analog voice signal into digital binary form where it can be stored or transmitted. The increasing use of digital networks has made the digitization of voice signals fairly common in recent years. (See A/D)

### Voice Grade

A telephone communications channel with the ability to transmit and receive voice conversation which falls in the audio frequency range of 300 Hz to 3,000 Hz (3 kHz).

### Voice Mail

An increasingly common electronic messaging process incorporated into many businesses, hotels, or restaurants allowing incoming calls to be transferred to electronic mailboxes in order to leave voice messages. Private voice-mail boxes also can be rented from some local telephone operators. Voice mail owners can access, listen to, save, or delete messages from any phone, anywhere, at any time using a special user-defined access code.

### Vortel - Vertical Portal

Vortels are an emerging category of websites seeking to build numbers of industry- or category-specific portals to satisfy various information demands for different business markets. Vortels also would be positioned to sell goods and provide information for an entire economic sector such as the online medical/health market.

Table 45

### VOD Market Estimates

	1999	2000	2001	2002
Installed base	5,000,000	8,000,000	11,000,000	14,000,000
Equivalent digital homes	3,846,154	6,153,846	8,461,538	10,769,231
Homes with VOD service	5%	15%	25%	40%
VOD-cabable homes	192,308	923,077	2,115,385	4,307,692
Buy rates	250%	250%	250%	250%
Number movies/home/month	2.5	2.5	2.5	2.5
Price/movie	2.99	2.99	2.99	2.99
Total annual revenue	5,750,000	27,600,000	63,250,000	128,800,000
% paid to studios	50%	50%	50%	50%

Source: DB&P/Webcast Track estimates

**VRAM - vt100****VRAM - Video RAM**

Memory used for transferring video or graphical images to a display monitor after moving the image out of buffer storage. VRAM resources can transfer data in and out of memory simultaneously, speeding up video screen imaging or drawing. Simultaneous I/O using VRAM is known as "dual porting" and is made possible because VRAM contains two separate data paths compared to traditional RAM, which has only one data path. A personal computer with 2 MBs of VRAM is able to handle television-quality video material.

**VRML -Virtual Reality Modeling Language**

A language for describing three-dimensional (3-D) image sequences and possible user interactions with them. Developers can use VRML to build a sequence of visual images into Web environments with which a user can interact by viewing, moving, rotating, and otherwise interacting with an apparently three-dimensional scene.

**VRU - Voice Response Unit**

Electronic hardware able to recognize human voice and convert analog voice signals into digital binary form. VRU applications are used to record dictation or to perform certain voice activated commands. VRUs can use remote touch-tone telephones as input devices that then act as an interface unit for a computer system. Capabilities exist to convert data into a synthesized voice signal for purposes of audibly relaying information to a distant telephone caller, or used to communicate with visually impaired users. (See Voice Recognition)

**VSAT - Very Small Aperture Terminal**

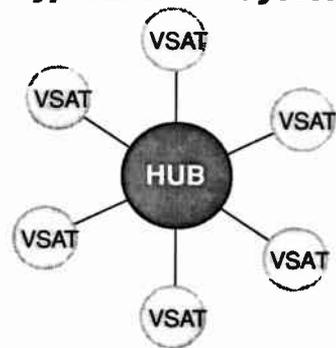
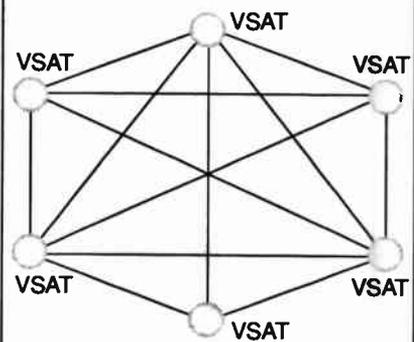
A type of satellite antenna typically ranging in size from 1.5 - 3.0 meters in diameter and used for transmitting and receiving one-way, or two-way data, voice, or video transmissions from C-band, Ku-band satellites. VSATs are capable of receiving point-to-point or point-to-multipoint services depending on users needs. Many businesses, retail stores, car dealers, and other businesses are part of large VSAT networks to receive sales instructions, or transmit daily receipts. As of early 1995, over 160,000 VSAT terminals were installed worldwide.

**VSB - Vestigial Sideband**

A type of RF transmission technique in which a typically generated double-sideband AM signal is technically filtered so that the energy of the sidebands are re-directed into one sideband. The enhanced sideband becomes the carrier signal and only a small portion of the other, complementary sideband is transmitted.

**vt100 - Video Terminal 100**

The most common standard for establishing a remote connection between a personal computer and a mainframe. (See Dumb Terminal, Terminal Emulation)

**Figure 148****Architecture of a Typical VSAT System****A Mesh-Connected VSAT Network**

Source: Comsat Corp.

**VTR – Video Tape Recorder**

A broader term than VCR for a magnetic tape recording device used for storing video information for future playback. VTRs can refer to older consumer recording machines that have functions similar to today's consumer VCRs. The term also refers to higher-quality professional equipment extensively used in video post-production houses where 1-inch or 2-inch tapes are spooled onto reels. Such extra widths on tapes provide more surface area to store information and means better overall performance quality.

## W-VHS - Warez

### W-VHS - Wide-Screen VHS

An industrial grade video format that records high-definition video at resolutions of up to 1,125 scan lines, which is the quality of HDTV. W-VHS tapes appear similar to regular VHS tapes, and are backward-compatible to be used in NTSC video production as well.

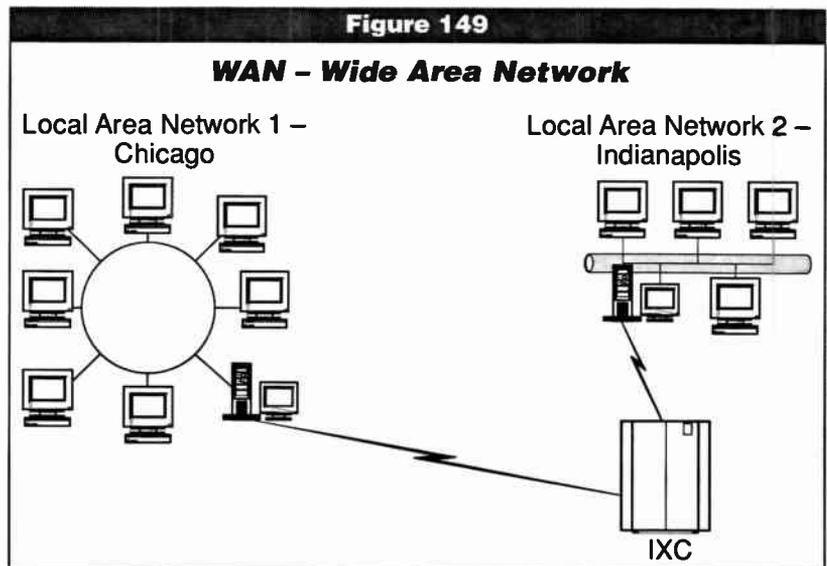
### WAIS - Wide Area Information Server

A powerful search tool or engine for looking up database or document information on the Internet. WAIS is one of a group of "search-and-deliver," programs implemented in the early- to mid-1990s and designed to streamline the process of locating information on non-Web networks. It has been especially useful in casting a very wide net when a user is seeking clues to information that are not easily narrowed or defined. WAIS enables users to search through several databases in various locations with a single query. Even though WAIS has been supplanted by easier-to-use, and more powerful Web search engine tools, it still provides a powerful query format for locating information on the Web. (See Search Engine)

### WAN - Wide Area Network

An extended communications network allowing data or other signals to be transmitted from a corporate or business LAN via the public telephone switched network or through a private alternative telecom service carrier, to another business LAN at some distant location. WANs are different from LANs in that signals are transported through an outside public or private telecom

carrier, whereas LAN's are usually restricted to a single business or building. A common WAN application is to use a telephone RBOC or ALT carrier to interconnect to LANs located in two separate cities, for example Chicago and Indianapolis.



Source: Bellcore

### Warez

Pronounced "wares" the term is cyber slang referring to websites maintained by "hackers" that distribute everything from unlicensed software to illegally obtained system passwords to codes to break into cellular phones and telecommunications systems. In addition, warez sites are infamous for spreading computer viruses. Such sites provide Internet users with free access to copyrighted software and video games, or pirated software can be downloaded for a fraction of the original cost. While a burgeoning business in Asia in particular, many warez piracy sites actually are hosted on U.S.-based Internet servers making it legally difficult, if not impossible, to shut down. According to the Business Software Alliance, the industry lost \$11 billion in 1998 to bootleg physical copies of pirated programs, but electronic distribution over the Internet makes this type of piracy pale in comparison to the potential dimensions of the losses incurred due to Internet

downloading. As of January 2000, warez sites were some of the most popular destinations on the Internet. (See Encryption Container, Hackers, Virus)

### Warm Boot

Refers to the process of restarting a computer without turning off the power to the system (on IBM-compatible machines this is executed by pressing Ctrl+Alt+Del on the keyboard). Some computer errors cannot be reset by a warm boot and require that power to the system be shut down and then turned back on (known as a "cold boot"). (See Boot or Boot-up)

### WATS - Wide Area Telecommunications Service

Discounted toll rate services offered by all long-distance and local phone companies. Out-WATS allows users to dial out at a discounted rate, while In-WATS allows companies leasing 800-lines for consumer marketing or information services to receive volume discounts.

### Watt

Unit of electric power representing the product of amperage and voltage. Electric devices or equipment will indicate power requirements in watts. Watts can be converted to amps by dividing the wattage by the voltage.

### Waveform Monitor

Generally, an instrument to display the characteristics of a modulated waveform. Such monitoring equipment is used to determine whether generated RF signals are meeting broadcast-quality standards for transmission.

### Wavelength

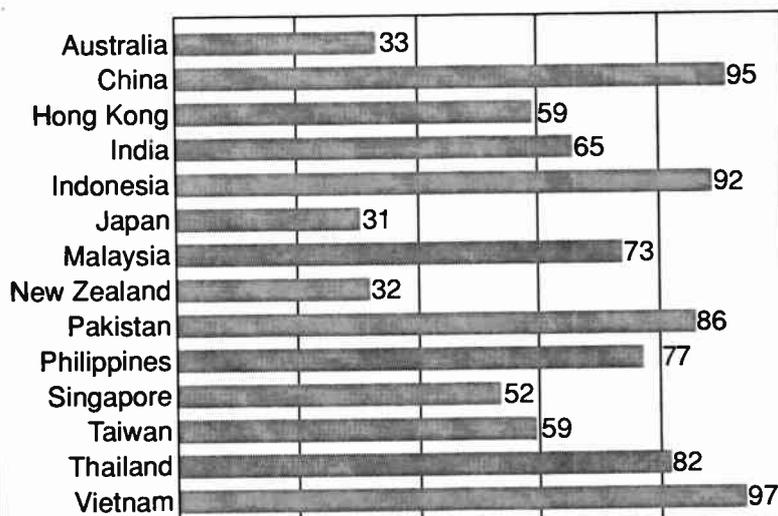
Refers to the distance between points of equal phase in a continuous periodic cycle measured at any instant in time. For example, in a sinusoidal wave — characteristic of RF signals — a wavelength might be measured from peak to peak, or trough to trough. In electromagnetic waves, wavelength is related to the frequency of the propagated signal, which travels one wavelength per each complete wave cycle, and is represented as 1 Hertz (Hz).

### Wearable Computers

The term refers to a computer that is always with the user, is comfortable and easy to keep and use, and is as unobtrusive as clothing. Current concepts of wearable computers range from today's virtual reality headsets and mini-pagers to a predicted near-future when computer devices

Figure 150

### Pirated Software\*



\* % of business software applications loaded onto PCs that were pirated, 1998

Source: Business Software Alliance

**Web - Web Clipping**

will be embedded in all types of wearables, such as clothing, eyeglasses, belts, and jewelry. (See Information Appliances, Palm-top Computing)

**Web**

Common lexicon for the "World Wide Web" – the graphics-rich portion of the Internet. As of January 2000, worldwide the Web reaches about 250 million users and contains about one billion Web pages. Web sites uses hypertext servers allowing text, graphics, and sound files to be accessed, combined and transferred over the Net. Websites offer a Home Page and other attached Web page files created using HTML protocols. Often Web pages contain hypertext links to other pages on the same site, or to other sites with related information or documents.

The Internet and Web are accessible via personal computers using a standard communications modem to connect to the telephone network. Connections also can be made through a LAN network with an HTTP server or is connected to a server site. Web software navigation programs or Web Browsers facilitate Internet "surfing" and viewing of documents. (See HTML, HTTP, Hypertext, Modem)

**Web Clipping**

A propriety system developed by 3Com's Palm Computing division that allows PalmPilot users to wirelessly browse specially formatted content on the Internet. Similar in concept to WAP (Wireless Application Protocol), Web clipping is generally regarded to be more viable because of the commercial penetration of PalmPilot

**Table 46**

**World Wide Web Basic Elements**

**TCP/IP**

- Transmission Control Protocol/
- Internet Protocol

**URLs**

- Uniform Resource Locators

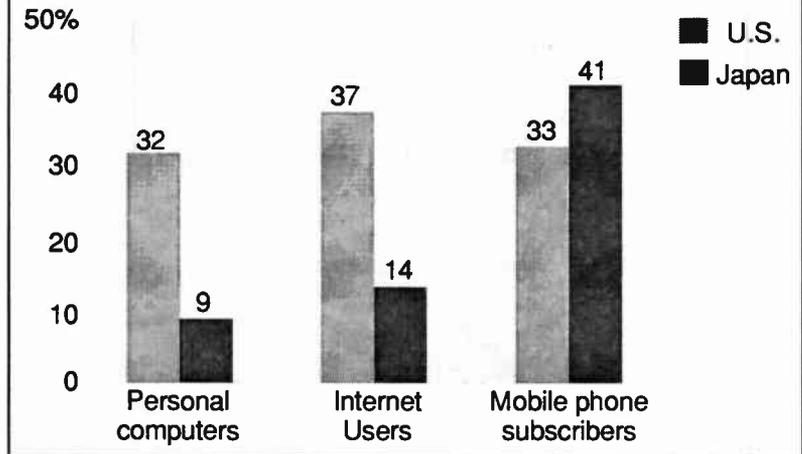
**Web Browser**

- HTML: Hypertext Markup Language

Source: NAB

**Figure 151**

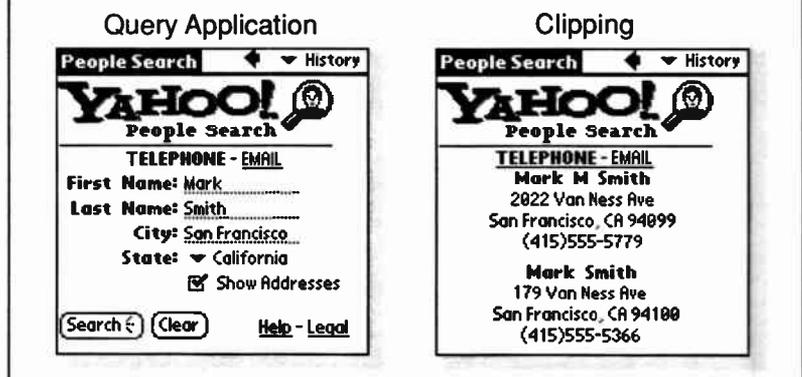
**PC and Wireless Web Access**



Source: Computer Industry Almanac, Ovum, Nielsen Media Research

**Figure 152**

**Example of Web Clipping**



Source: Smart Card Forum

products and because the PalmPilot devices have larger screens than traditional cell phones or pagers. An example of what clipped content looks like on a PalmPilot is included below (See Information Appliance, Palm-top Computing)

### Web E-Commerce

The fastest growing website properties during the last quarter of 1999 saw eToys at the top of the list, followed by Sears, JCPenney and The Gap. Package shipper, UPS, also found its website affected positively by holiday season 1999 Web commerce due to online gift orders needed rapid delivery. Among the top e-commerce websites were a number of popular brands names from the offline world including Sears, CBS, JCPenney and The Gap.

Such top showings reveal that major-brand retailers and media companies are beginning to exploit the universal power of their brand names on the Web.

### Web Page

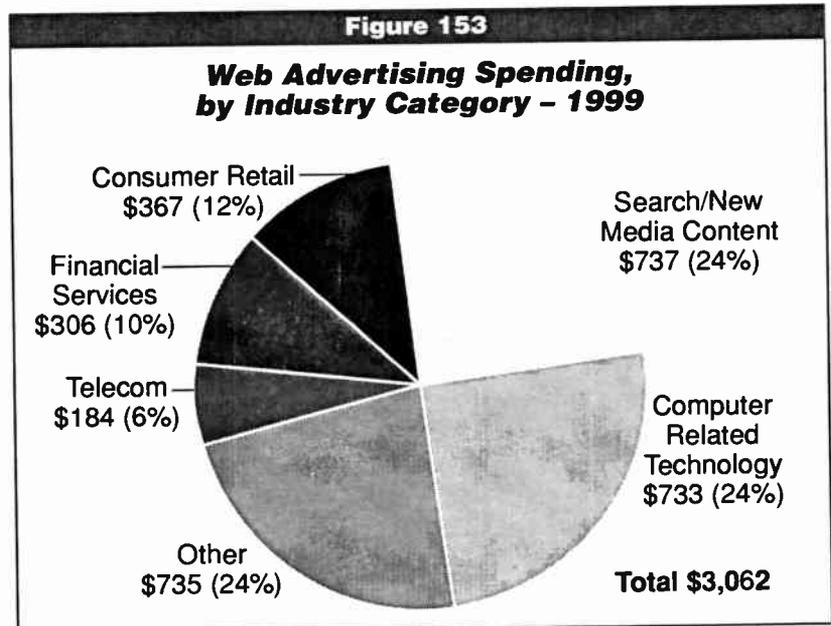
Text and graphics documents attached to a Web Home Page providing a range of information available to any user accessing the site. Companies, individuals, organizations, government offices, agencies, even the White House, have created their own Web pages to convey information for public consumption about the sponsor. Web pages contain basic information, reference materials, and often provide hyperlinks or automatic transfers to other Web pages or websites of related interest or on related topics or issues.

### Web Server

A computer on which website addresses are stored and delivered to a user's browsers. A Web server fulfills requests from users who type in the URL of a particular website by delivering the text and graphics to the user-computer's address. Web servers can also be configured to handle interactive requests such as product orders, search requests, and credit-card validations. (See Active Server Pages, Browser, Common Gateway Interface, E-Commerce, Internet, URL)

### Webcasting

Refers to the distribution of audio, video, text, data, graphics, multimedia content, etc. usually employing digital bit streaming protocol via the Internet to audience consumers, businesses, or other end-user communities. Webcasting is the process of publishing (posting), distributing, or delivering subscription material, information content, live video, images, text or other media from one point or source to many users or recipients simultaneous. According to the authors of *The Internet Age Broadcaster*, Webcasting usually embodies audio/video streaming, push, or electronic software distribution. Interactivity also may be possible with the addition of telephony



Source: eMarketer, 1999

## Webcasting Radio Receivers - Website

conferencing, textual and graphical communication capabilities. (*Internet Age Broadcaster* 8 1998 National Association of Broadcasters, by Peggy Miles and Dean Sakai. A revised second edition was released in April 2000.) (See IP Multicasting)

### Webcasting Radio Receivers

More than 3,000 radio stations are digitally streaming broadcasts over the Web, and growing numbers of Internet-only Webcast "radio stations" are emerging. Companies are beginning to develop stand-alone Internet Webcast radios, which can be considered a subset of the growing Internet appliances market. iRad is an Internet appliance from Audioramp.com that can be connected via a 56K modem through a phone line, or home PC system for listening to streaming audio programs using a pair of attached speakers. A speakerless version with digital input jacks for connecting directly to a home stereo system also is available. The iRad devices incorporate an AM/ FM receiver and via a PC hook-up are able to play stored MP3 audio files. The company's website can be used as a "personal audio manager" to automatically download listener selections from the site's playlist files. Availability of iRad's Webcast radios are scheduled for April 2000, and target priced at about \$399. Another stand-alone Internet receiver for playing stored MP3 audio files is the Kerbango receiver. The Kerbango Web radio also is equipped with an AM/FM receiver and can be connected to separate stereo speakers. Kerbango's website offers an extensive directory to Internet Webcasting sites and a list of archived material ready for Web streaming. Debuting in spring 2000, the Webcast receiver will retail for less than \$300, according to the company. Both companies are betting that by eliminating PCs from the Webcasting equation will increase the popular acceptance of Webcast radio listening. While good in theory, many Web-based streaming audio sites offer less than the usual stereo-quality sound from local FM stations. Required reliance on current phone line modems and network connections also may dampen user enthusiasm. (See MP3, Streaming Media)

### Webhead

Refers to a compulsive or frequent contributor or user of the World Wide Web. (See Digerati)

### Webmaster

An Internet-related reference often meaning the administrator responsible for a particular World Wide website, or the person in charge of the management and design of the site.

### Website

Refers to any address/location on the World Wide Web. The site can range from a single Web "Home Page" to a

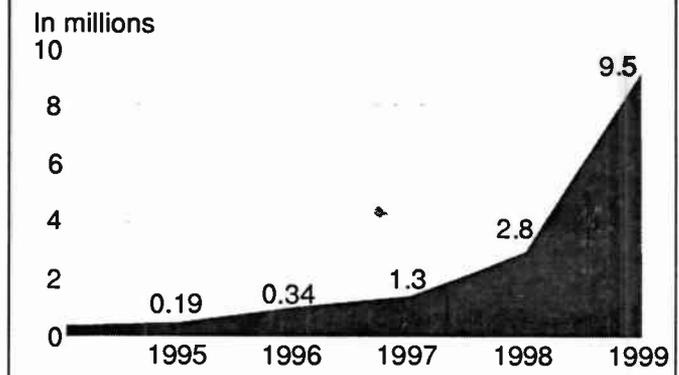
Figure 154

### Webcasting's on Digital Business Radar Screen



Figure 155

### Number of Websites Worldwide



Source: Netcraft; September 1999

Table 47

**Top Websites Visited  
(Holiday Season 1999)**

Rank	Domain	Total Visits (millions)
1	ebay.com	128.86
2	amazon.com	48.96
3	etoys.com	14.46
4	barnesandnoble.com	12.97
5	cdnow.com	12.38
6	toysrus.com	12.11
7	sony.com	8.08
8	buy.com	7.42
9	kbkids.com	6.33
10	jcpenny.com	5.89
11	qvc.com	5.85
12	egghead.com	5.19
13	beyond.com	4.56
14	ubid.com	4.56
15	quixtar.com	4.53

Source: Nielsen/NetRatings, January 2000

Table 48

**Top 10 Web Properties  
(U.S., February 2000)\***

Property	Reach %	Time per Person
1. AOL Websites	60.29	0:28:20
2. Yahoo!	55.97	1:00:44
3. MSN	39.60	0:54:05
4. Excite@Home	32.59	0:27:44
5. Lycos Network	30.49	0:20:42
6. GO Network	22.98	0:21:11
7. Microsoft	20.52	0:10:25
8. Time Warner	17.27	0:13:00
9. NBC Internet	16.99	0:13:00
10. Amazon	14.61	0:13:53

\* Estimates are based on a sample of households that have Internet access and use Windows 95/98/NT, and MacOS 8 or higher.

Internet universe is defined as all members (ages 2+) of U.S. households which currently have access to the Internet.

Source: Nielsen/Net Ratings; ©2000 NetRatings, Inc.

series of directories to other pages containing series of documents which are all linked together under the initial website address.

**WebTV**

Now owned by Microsoft, WebTV was one of the first entries in the much publicized convergence of the World Wide Web with television. Generically, WebTV can be classified under a category called Personal Video Recorders (PRVs). WebTV subscribers use a set-top box similar to a cable box to sign up with a WebTV access service. Users can surf the Net using WebTV's browser

Table 49

**Top Television Websites  
(December 1999)**

Site	Unique audience* (000)	Total time spent (min:sec)
1. MSNBC.com	3,846.1	10:59
2. Disney.Go.com	3,295.2	14:16
3. ESPN.Go.com	3,248.6	21:18
4. CNN.com	4,746.6	16:33
5. MTV.com	2,200.3	8:58
6. eonline.com	1,739.4	6:25
7. Discovery.com	1,611.9	9:18
8. Nick.com	1,587.6	15:04
9. ABC.Go.com	1,485.1	8:47
10. CNNSI.com	1,196.5	18:54
11. ABCNews.Go.com	1,127.8	6:52
12. PBS.org	1,039.5	10:16
13. CBS.com	1,003.1	7:44
14. TVGuide.com	930,709.0	11:08
15. FoodTV.com	929,140.0	14:31

Note: Data is based on audience measurement of more than 39,000 U.S. panelists with Internet home access.

Source: Nielsen/NetRatings

**Wetware - Windows Media Technologies**

and a hand-held remote control unit to view and interact with content on their television screen. A standard keyboard is provided as an option for browsing. As of January 2000, WebTV had about 1 million customers in the U.S. (See PVR)

**Wetware**

Refers usually to computer software, but could refer to other creative software such as CD-ROM, graphics animation applications, etc., in which the product is the direct result of creative human intelligence or "brainware."

**Whiteboard**

Refers to the feature of many videoconferencing systems that makes it possible for conference participants to work on a common display area that allows for writing or drawing that is then shown on all of the participants' monitors at the same time. (See Application Sharing, Videoconferencing)

**Wideband**

Refers to telecommunication facilities, whether wired or wireless, where a channel has a bandwidth greater than that used for voice-grade telephone services (4 kHz). Wideband video channels offer much greater capacity than typical 6 MHz channels used for NTSC television broadcasting, although compression techniques are being used to squeeze multiple video channels (4 - 5) in the same spectrum used for a single analog television channel. Compression makes the advantages of wideband facilities such as satellite transponders (36 - 72 MHz) or fiber optic lines even greater for transmitting multiple NTSC or even HDTV video services.

**Wildcard Character**

A special computer keyboard character, or sequence of characters, which are used to represent one or more other characters. Usage in the computer and Internet worlds is similar to a joker in a deck of playing cards that can be made a "wild card" to act as any other card in the deck. Wildcard enabled systems allow computer users to search for all files with names that contain similar qualities. For example, in Microsoft Windows, a user could search for all Microsoft Word files that begin with the letter "s" by searching for "s\*.doc." The asterisk is used as the wildcard to represent all other character sequences following the initial "s" letter). The technique can be very useful if a user cannot remember a specific file name or would like to see an entire grouping of files that were created to share some part of their name in common.

**Windows**

The world's most popular set of operating systems for IBM-compatible personal computers, Windows is produced by the world's largest software maker - Microsoft. The first version of Windows (version 1.0) was released in 1985, but Microsoft's graphical interface didn't gain significant market share until the release of version 3.1 in 1992. In January of 2000 the current versions include Windows 98 and Windows NT 4.0 are about to be folded into a single desktop operating system called Windows 2000.

**Windows Media Technologies™**

Former trade name, NetShow, allows the user to create, distribute, and play streaming media files (audio, video, and animation). Windows Media Technologies are distributed as part of the Windows 2000 operating system. (See Streaming Content)

**Winsock™**

Winsock is a programming interface and the supporting program that handles information requests for Internet applications on computers using the Microsoft Windows operating system. In other words, it's the software that allows a personal computer to function on the Internet. Winsock is built on a particular convention for connecting with and exchanging data between two program processes within the same computer or across a network. Winsock runs between an application program such as a Netscape browser and the Internet program in the user's computer - TCP/IP. (See Operating System, TCP/IP)

**Wintel**

Refers to all machines running a Microsoft Windows operating system and using an Intel computer processor. While Wintel configurations accounted for the lion's share of new computer purchases in the middle 1990s, Wintel market share began to decline after its high of approximately 87% of all personal computers sold in 1997. Competition is increasing for both Microsoft and Intel, as alternative operating systems, such as Linux, and competing chip makers, such as AMD, are grabbing larger and larger pieces of this expanding market. (See Intel, Windows)

**Wipe**

A video production-related term referring to the process of seamlessly switching two different video sources during a particular video segment. Wipes are created by an electronic analog or digital switcher and are seen as a visible transition temporarily partitioning a viewing screen into two different video, color or text sections. Each section is produced by a different video source.

**Wireless Application Protocol (WAP)**

A broadly supported open international standard that adds mobility to Internet access via wireless devices such as mobile phones, organizers, personal digital assistants, car radios, and navigation systems. For example, a WAP-enabled mobile phone can be used to retrieve weather forecasts, traffic information, and stock quotes from the Internet. WAP specifies two essential elements of wireless communication: an end-to-end application protocol, and an application environment based on a network browser front-end. Digital wireless devices such as mobile phones are technically are no longer simply telephones, but are quickly becoming universal communication devices capable of running software, accessing the Internet, and communicating with other devices and applications over wireless networks. The wireless protocol is a layered communication standard embedded in WAP-enabled devices. The network portion includes a server component to implement the connection protocol, which enables communicating with any other WAP-designated device. The WAP protocol enables access Internet content and advanced telephony services on digital cellular phones and other wireless terminals. Since the WAP protocol is independent of the underlying airlink standard and scaleable to different devices, application developers can write a single application that will run on all carrier networks, all transport protocols, and all wireless devices. For the first time, developers can gain unified access to the entire global user community. (See Information Appliances, Wireless Information Appliances)

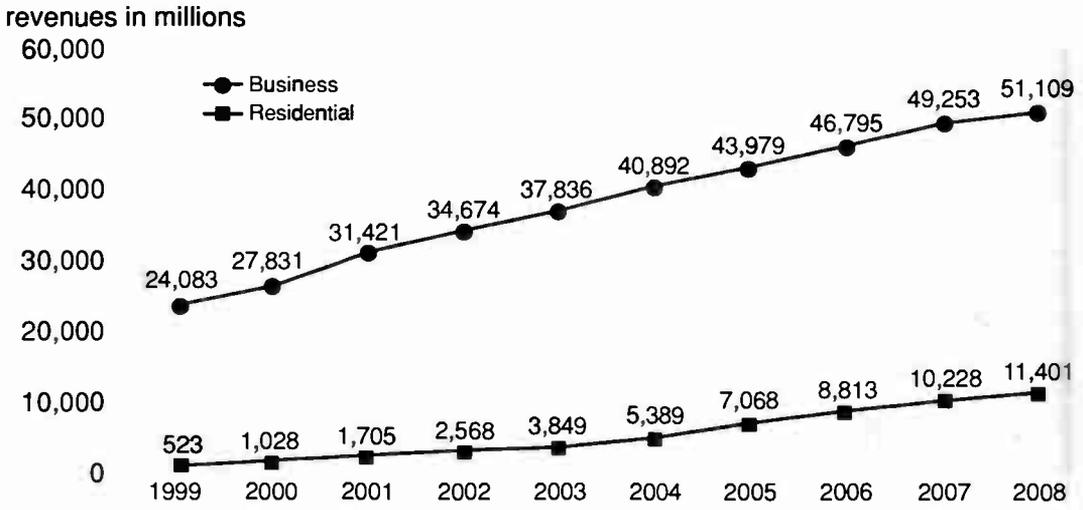
**Wireless Broadband Fixed Access**

Refers to a segment of the wireless multichannel video/data market (formerly called Wireless Cable) in which video programming and data sources – including television station signals that are retransmitted – are delivered consumer residences via terrestrial microwave frequencies. Globally, wireless broadband access services are increasingly in demand to serve populations where video delivery options are limited. Wireless broadband access systems serve millions of subscribers around the world. (See LMDS, MMDS, Wireless Communications, Wireless Data)

**Wireless Communications**

**Figure 156**

**Potential Broadband Wireless Access Revenues  
(North America 1999-2008)**



\* Includes MDS, MMDS, LMDS

Source: The Strategis Group, Inc; courtesy of Wireless Communication Association International (WCAI); contact www.wcai.com

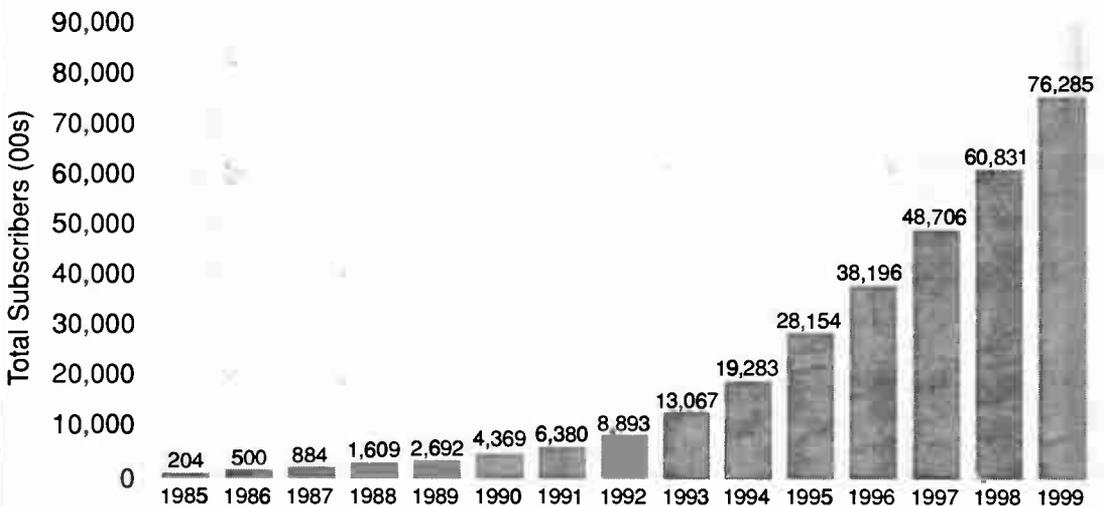
**Wireless Communications**

Encompasses two broad, fast growing categories of spectrum frequency-based, increasingly digital instead of older analog-based communications services.

1. One category includes *mobile* wireless communications services including cellular and PCS telephony, ESMR, paging, messaging, and satellite mobile phone/data services. Many services

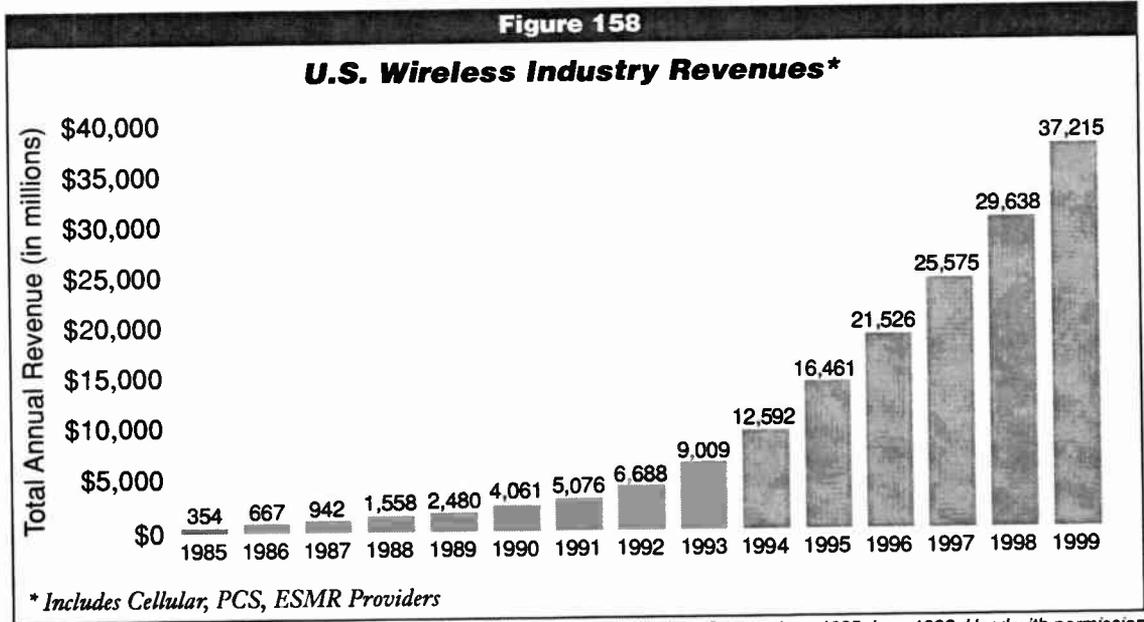
**Figure 157**

**U.S. Wireless Industry Subscribers\***



\* Includes Cellular, PCS, ESMR Providers

Source: The CTIA Semi-Annual Wireless Survey, June 1985-June 1999. Used with permission



Source: The CTIA Semi-Annual Wireless Survey, June 1985-June 1999. Used with permission



Source: Courtesy of the Personal Communications Industry Association (PCIA), Wireless Market Portfolio, Contributors: Yankee Group, Paul Kagan Associates. Contact: [www.pcia.com](http://www.pcia.com).

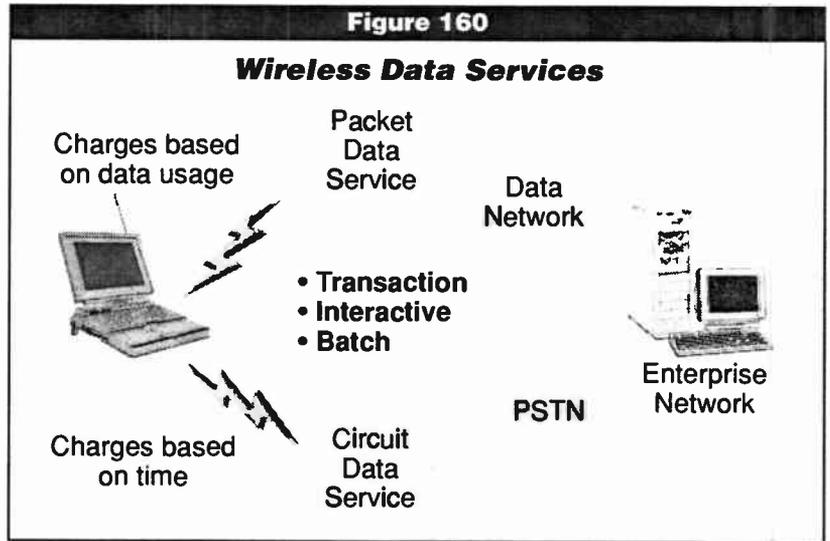
are providing links to the expanding range of wireless Internet appliances including PDAs, laptop computers, and 3G mobile handset phones.

2. A second broad industry sector in the wireless communications market is the equally dynamic wireless broadband *fixed access* market. Providers offer point-to-multipoint services from a stationary antenna base, or series of bases, and include MMDS, LMDs, unlicensed local wireless services such as Metricom, and even emerging broadcast datacasting services. (See Cellular Telephone, Datacasting, LMDS, MMDS, PCS, Wireless Broadband Fixed Access)

**Wireless Data - Wireless Internet Access**

**Wireless Data**

Wireless data is a subset of each of these two wireless communications industry segments. It encompasses digital data transfers/exchanges over a various RF-based networks. Wireless data services are transported over networks include digital cellular CDPD, PCS, ESMR packet data services, fixed/non-mobile wireless systems (MMDS, LMDS, datacasting) and a host of current and future satellite Internet access systems (e.g., Teledesic, Spaceway, Odyssey, Globalstar, etc. (See Wireless Internet)



Source: 1996 Buyer's Guide

**Wireless Information Appliances**

Refers to a growing market of electronic devices, predominantly handheld mobile equipment, such as palm-top computers, handheld computers, pagers, and mobile telephones that offer wireless access to Internet and other RF transmitted data/information. (See Internet Appliances, Palm-top Computers)

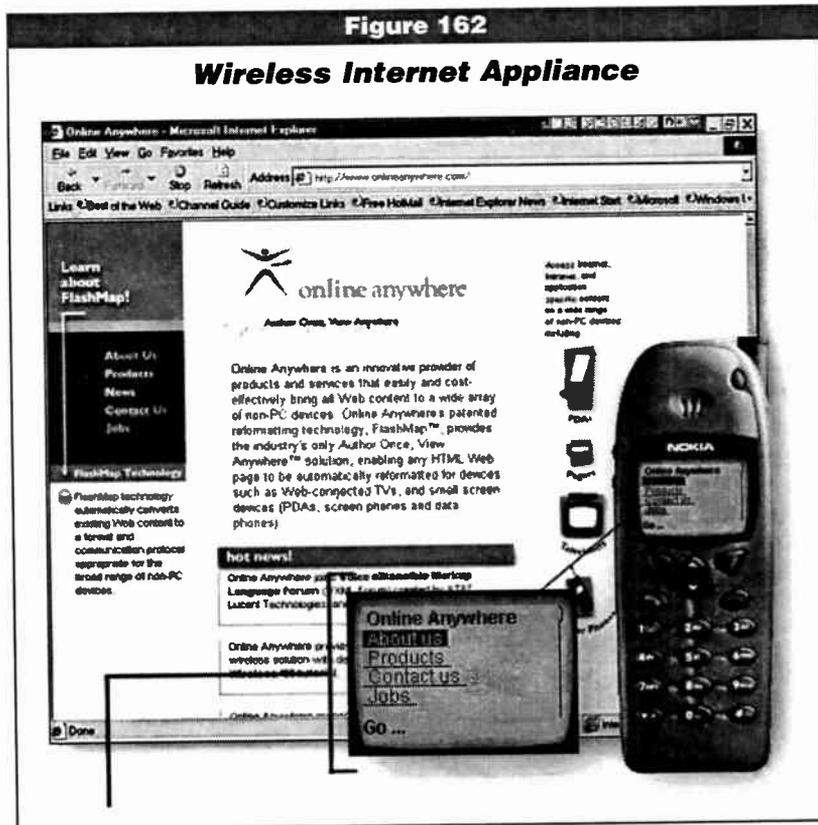
**Wireless Internet Access**

The next wave of Internet development combining advancing wireless mobile technologies and Internet access, with the ability to access and receiving Internet data/information anywhere, anytime. Wireless Internet services utilizing spectrum frequencies – whether terrestrial or satellite – for delivery of Internet services instead of fixed wired links such as telco DSL, cable or other private broadband wireline network services. Internet access and transmission has become a



Source: Money Magazine, December 1999

significant productivity tool for corporations and consumers alike. Companies are benefiting from cost savings associated with their ability to transact business online, and from having interactive contact directly with their clients/customers. Consumers are empowered by 24/7 around-the-clock access to products, services, and information. Corporations and consumers no longer need to be tethered to wired networks or laptops and wired modem for Web connectivity. Although international adoption of Internet access lags that of the U.S. at present, e-commerce, wireless phone and broadband services are much further advanced overseas, and moving directly to third-generation (3G) wireless applications. A leveling of the playing field is forecast to produce a major expansion in the wireless Internet market in the next five years. (See 24/7, 3G, Internet Appliances.)



Source: Online Anywhere

### Wireless LAN

A type of wireless campus-wide or private business-park digital data network used for Internet connection, e-mail delivery, file transfers, and other application services.

### Wireless Web Devices

New technology promises reception of audio and video content streamed to hand-held wireless Internet appliance such as 3Com's Palm Pilot that improving on existing hand-held wireless devices. Developers such as INTERVU and PacketVideo are conducting field trials enabling mobile users to listen to and/or watch streamed audio and video material offered on websites. Such Web devices are expected to be mainstream consumer electronic equipment in 3-5 years. (See Handheld, Internet Appliances, Palm-top Computing, Wireless Internet Access)

### Word

In computers, a word represents a specific set of digital numbers that are used as the foundation for an operating system to execute computer instructions. Typical digital computer word lengths are 8-bit words representing one byte, 16-bit words or two bytes, or 32-bit systems using 4 bytes. Word lengths usually correspond to the bus structure of a computer representing the total number of circuit lines on the bus. Newer 32-bit operating systems are available and 64-bit systems are in development for video game machines.

**Workgroup Computing - WYSIWYG****Workgroup Computing**

Refers to software tools and technologies that are designed to support groups of people working together on a project, often at different sites and connected through a computer network. Workgroup computing typically involves email, the sharing of data files, coordinated scheduling, and workflow management.

**Workstation**

In computer environments, a workstation is any computer that is attached to a telephone wall outlet. Whether attached to a network or a stand-alone machine, workstations can have a range of capabilities from a dumb terminal used only to perform data entry to a machine used for high-speed processing of complex graphically oriented tasks.

**World Wide Web**

(See Web)

**Worldspace**

Worldspace is a privately held U.S. satellite digital radio service (SDARS), based in Washington, DC. The stated mission of the service is to serve populations outside the U.S. that do not have access to radio services, specifically in developing areas of the world including Africa, the Middle East, Asia, Latin America and the Caribbean. The first satellite in the fleet, AfriStar, became operational in late 1999 and is built to deliver 100+ channels of radio service to Africa and parts of the mid-East. The launch of additional satellites is planned for the next year or two. Contact: [www.worldspace.com/](http://www.worldspace.com/) (See SDARS.)

**WORM - Write-Once/Read-Many**

An acronym for a type of computer hard disk, video/audio compact disk, or optical laserdisc which are written on only once in the initial recording process. Thereafter, many users are able to read the stored information, but users cannot alter, or write onto the storage medium. WORM optical discs are similar to CD-ROMs, but are more easily created. The WORM process makes production of single-copy commercial audio or video discs more practicable. The most popular sizes for write-once optical discs have memory storage capacities ranging from 200 MB to 800 MB of data, and the physical size of the disc is 5.25 inches.

**WWW - World Wide Web**

(See Web)

**WYSIWYG - What You See, Is What You Get**

Pronounced "wizzy wig," this euphemistic computer term is often used in word-processing or other text and graphic documents suggesting that what is displayed on the computer screen, is what *should* be produced in hardcopy when printed. If this were only true, many computer users would be delighted. Essentially, page layout, size, typeface, and other publishing functions should be able to be viewed prior to printing. Older word processing applications would alter typeface styles (bolding, italics, underlining) but did not display the results on the screen. Newer applications show most text alterations and allow viewing of the formatted page including graphic insertions, so WYSIWYG is indeed much closer to what you might get when a document is printed.

**X.25**

X.25 is a type of packet-switched data communications network that enables signals to be transferred between systems or equipment built by different manufacturers and adhere to various technical specifications. In packetizing data, digital information is divided into blocks containing data, an address, and error correction/control information. Individual data packets carry about 2 kbps of binary information. The X.25 protocol is an international technical standards recommendation from the ITU-T for packet-switched data networks.

**X-Band**

The portion of the electromagnetic spectrum ranging from about 7 GHz - 8 GHz. Frequencies in this band are used primarily for military satellite communications.

**XDS - Extended Data Service**

Data signals transmitted as part of a standard NTSC television broadcast signal normally using Field 2, Line 21 of the vertical blanking interval. This digital data capacity may be used for new data broadcasting or datacasting businesses to transmit a range of information to television viewers or other datacasting subscribers. Using XDS capacity, stations could transmit such information as their call signs, network affiliation, or other program-related information (actors, storyline, and upcoming episodes) on shows being aired for viewing. (See Closed Captioning, Datacasting, VBI)

**XM**

A reference to XM Satellite, Inc. - one of two U.S. satellite radio companies beginning business operations in 2000 - 2001. XM and its competitor, Sirius, will operate their SDARS services using S-band spectrum frequencies. The two rivals agreed in early 2000 to adopt a single interoperable standard for construction of their respective S-band mobile satellite receivers. With adoption of a single technical standard, consumers will be able to pick up signals from both U.S. providers. The interoperable receivers will not be available until the second generation of receiver production in 2004. The FCC had mandated that the SDARS companies develop technology that would allow customers to listen to any current or future services on any SDARS receiver marketed in the United States. (See SDARS.)

**XMS - Extended Memory Specification**

This creates the High Memory Area and then governs access to and the allocation of the remainder of the extended memory.

**Y - Luminance or Y<sup>o</sup> - Luma**

A measure of the intensity or brightness of light. In television, the symbol for brightness is actually Y<sup>o</sup> which technically is not luminance, but refers to the sum of the primary colors called luma. Luma is the part of the video signal that carries the information determining how bright a displayed video signal should be.

**Y<sup>o</sup>/C Video**

In television video, the luma or brightness information in a video frame is denoted by a "Y<sup>o</sup>" and the chrominance or color part of the signal is denoted by a "C". In the industry and other video production environments, Y<sup>o</sup>/C video is used simply as way of noting the luma and chrominance in a video signal. This term is often used in discussing Super VHS (S-VHS) and is known as S-video.

**Y<sup>2</sup>UV Color System - Zulu Time****Y<sup>2</sup>UV Color System**

A color encoding scheme for video pictures in which luma and two scaled chrominance signals are separately transmitted. This can be the format of an intermediate step in encoding a signal into NTSC or PAL.

**Z**

Symbol used in electrical engineering and electronics to represent impedance. (See Impedance)

**Zip Drives/Zip Disks**

A disk drive from Iomega Corporation which uses removable 100 megabyte or 250 megabyte cartridges. One of the most popular forms of mass storage, both internal and external zip drives are manufactured, making the Zip drive suitable for backup, mass storage or for moving files between computers. Software is included to help with file organization.

**Zip/Unzip**

Refers to the process of copying one or more large-size computer files and compressing them into a single, smaller or "zipped" file. The term originated with the release of Iomega's Zip Drive and Zip Disk peripheral equipment. The terms are used generically to refer to the compression ("zip") of files and reverse or decompression ("unzip") of the same files back into their original format to make them usable again. Because "zipped" files are much more compact than the originals, it makes them easier to transport especially on disk and/or over the Internet. (See Compression, pkZIP)

**Zoom**

A function of high-quality 35mm cameras and commonly available on video camera recorders (camcorders) allowing users to record close-up video images.

**Zulu Time**

Used as another reference for standardized Greenwich Mean Time or today's Coordinated Universal Time. (See GMT, UTC)

# APPENDIX

## Industry Organizations, Associations, Committees, Groups

### **ABSOC - Advanced Broadcast Systems of Canada**

Industry organization focusing on the development of advanced television broadcasting systems in Canada. Address: 208 Rue Albert, 10th Floor, Ottawa, Canada, K1P 5G8. Tel: 613-236-5850.

### **ACAS - Academy of Television Arts and Sciences**

Organization working to advance telecommunication arts and sciences. Sponsors Primetime Emmy Awards. Address: 5220 Lankershim Blvd., North Hollywood, CA 91601-3109. Tel: 818-754-2800. Fax: 818-761-2827. Website: [www.emmys.org](http://www.emmys.org). E-mail: [webmaster@emmys.org](mailto:webmaster@emmys.org).

### **ACTA - America's Carriers Telecommunications Associations**

Lobbying organization for small long-distance telephone carrier companies.

### **ACTAS - Alliance of Computer-Based Telephony Application Suppliers**

Part of the North American Telecommunications Association (NATA); the Alliance focuses on promoting computer-based telephony applications, and supporting manufacturers of these applications.

### **AEA - American Electronics Association**

Trade association representing electronic manufacturing companies and technology industry. Address: 5201 Great America Pkwy., P.O. Box 54990, Santa Clara, CA 95056-0990. Tel: 408-987-4200. Fax: 408-970-8565. 601 Pennsylvania Ave., NW, North Building, Ste. 6001, Washington, DC 20004. Tel: 202-682-910. Fax: 202-682-9111. Website: [www.aeanet.org](http://www.aeanet.org). E-mail: [csc@aeenet.org](mailto:csc@aeenet.org).

### **AES - Audio Engineering Society**

Professional association of engineers and others working in the sound industry and related fields. Address: 60 E. 42nd St., Rm. 2520, New York, NY 10165. Tel: 212-661-8528. Website: [www.aes.org](http://www.aes.org). E-mail: [HQ@aes.org](mailto:HQ@aes.org).

### **AFNOR - Association Francais Normal**

The national standards organization of France. Address: Tour Europe, 92049 Paris La Defense Cedex. Tel: 33.1.42.91.55.55. Fax: 33.1.42.91.56.56. Website: [www.afnor.fr](http://www.afnor.fr). E-mail: [webmaster@email.afnor.fr](mailto:webmaster@email.afnor.fr).

### **AFTRA - American Federation of Television and Radio Artists**

A union for radio and television performers. Address: 260 Madison Ave., New York, NY 10016. Tel: 212-532-0800. Website: [www.aftra.com](http://www.aftra.com). E-mail: [info@aftra.com](mailto:info@aftra.com).

### **AIM - Association for Interactive Media**

Trade association providing support for internet projects for strong companies in a variety of industries. Address: P.O. Box 33399, Washington, DC 20033-0399. Tel: 202-408-0008. Website: [www.interactivehq.org](http://www.interactivehq.org).

### **AITP - Association of Information Technology Professionals**

Formerly the Data Processing Management Association (DPMA) which was renamed in 1996. AITP is a membership organization devoted to providing professional development to individuals in the information systems field. It originated the CDP examinations which were later administrated by the ICCP. Address: 315 South Northwest Highway, Suite

200, Park Ridge, IL 60068-427. Tel: 847-825-8124 or 800-224-9371. Fax: 847-825-1693. Website: [www.aitp.org](http://www.aitp.org). E-mail: [aitp\\_hq@aitp.org](mailto:aitp_hq@aitp.org).

### **Alliance for Internet Security**

Recent group formed and dedicated to the widespread adoption of security measures to address the recent rash of distributed denial of service attacks (DDoS). Alliance was founded by ICSA.net, Reston, Virginia, an Internet security company with members including Cable One, Cable & Wireless, Digex, Global Crossing and its subsidiary GlobalCenter, GTE Internetworking, Level 3 Communications, and Sprint Communications. Website: [www.icsa.net/html/communities/ddos/alliance](http://www.icsa.net/html/communities/ddos/alliance).

### **ALTEL - Association of Long Distance Telephone Companies**

Trade association composed of alternative long-distance carriers and long-distance resellers.

### **ALTS- Association for Local Telecommunications**

Represents the builders of high-speed local communications that are "facilities based." Address: 888 17<sup>th</sup> St., NW, Suite 900, Washington, DC 20006. Tel: 202-969-ALTS. Fax: 202-969-ALT1. Website: [www.alts.org](http://www.alts.org). E-mail: [sslater@alts.org](mailto:sslater@alts.org).

### **ALTV- Association of Local Television Stations**

Trade association representing the interests of local commercial independent television stations. Formerly Association of Independent Television Stations (INTV). Address: 1320 19th St. NW, Ste. 300, Washington, DC 20036. Tel: 202-887-1970. Fax: 202-887-0950. Website: [www.altv.com](http://www.altv.com). E-mail: [ltv@erols.com](mailto:ltv@erols.com)

### **ANSI - American National Standards Institute**

Clearinghouse for voluntary standards in a variety of industries. Headquarters: 1819 L

St., NW, Washington, DC 20036. Tel: 202-293-8020. Fax: 202-293-9287. New York Office: 11 W. 42nd St., 13th Fl., New York, NY 10036. Tel: 212- 642-4900. Website: [www.web.ansi.org](http://www.web.ansi.org). E-mail: [ansionline@ansi.org](mailto:ansionline@ansi.org).

### **APTS - Association of Americas Public Television Stations**

Organization representing the interests of public television stations in the United States. Formerly National Association of Public Television Stations. Address: 1350 Conn. Ave. NW, Ste. 200, Washington, DC 20036. Tel: 202-887-1700. Website: [www.aptv.org](http://www.aptv.org), e-mail: [webmaster@aptv.org](mailto:webmaster@aptv.org).

### **ASCAP - American Society of Composers, Authors, and Publishers**

Music licensing organization. Address: 1 Lincoln Plaza, New York, NY 10023. Tel: 212-595-3050. Website: [www.ascap.com](http://www.ascap.com).

### **Association for Interactive Media**

Address: 1301 Connecticut Ave, NW, 5<sup>th</sup> Floor, Washington, DC 20036. Tel: 202-408-0008. Website: [www.interactivehq.org](http://www.interactivehq.org).

### **ATEL - Advanced Television Evaluation Lab (Canada)**

Industry working group established to test proponent HDTV systems. Address: ATEL, c/o Communications Research Center, 3701 Carling Ave., PO Box 11490, Station H, Ottawa, Canada, K2H8S2.

### **ATIS - Alliance of Telecommunications Industry Solutions**

Provides industry forum secretariat services, committee management and administration, legal counsel, public relations and media outreach, technical assistance, internet services and Website maintenance, and printing and publishing facilities. Address: 1200 G. St, NW, Washington, DC. Tel: 202-628-6380. Website: [www.atis.org](http://www.atis.org).

**ATM Forum**

Worldwide organization aimed at promoting ATM within the industry and end user community. Address: 2570 West El Camino Real, Ste. 304, Mountain View, CA 94040-1313. Tel: 415-949-6700.

**ATRC - Advanced Television Research Consortium**

Consortium of companies working to develop standard for HDTV. Consortium included NBC, Thomson Consumer Electronics, Philips Laboratories, David Sarnoff Research Center and Compression Labs. Merged with other HDTV developers to form Grand Alliance.

**ATSC - Advanced Television Systems Committee**

Membership organization addressing technical standards pertaining to advanced television systems and operations. Address: 1750 K Street NW, Suite 800, Washington, DC 20006. Tel: 202-828-3130. Website: [www.atsc.org](http://www.atsc.org). E-mail: [atsc@atsc.org](mailto:atsc@atsc.org).

**ATTC - Advanced Television Test Center**

Technical laboratory and testing facility supported by the television broadcasting industry to support HDTV and advanced television testing and evaluation. Address: 1330 Braddock Pl., Ste. 200, Alexandria, VA 22314. Tel: 703-739-3850. Website: [www.attc.org](http://www.attc.org).

**ATVEF**

Advanced Television Enhancement Forum – a joint effort of broadcasters, cable companies, content companies and manufacturers. Address: ATVEF Licensing LLC, P.O. 415, Eldorado Springs, CO 80025. Fax: 303-554-0618. Website: [www.atvef.com](http://www.atvef.com). E-mail: [info@atvef.com](mailto:info@atvef.com).

**BICSI - Building Industries Consulting Service International**

Organization offering training and certification to those working in telecommunications cabling. Address: 8610 Hidden River Parkway,

Tampa, FL 33637-1000. Tel: 813-979-1991. Fax: 813-971-4311 Website: [www.bicsi.org](http://www.bicsi.org). E-mail: [bicsi@bicsi.org](mailto:bicsi@bicsi.org)

**BMI - Broadcast Music, Inc.**

Music licensing organization. Address: 320 W. 57th St., New York, NY 10019. Tel: 212-586-2000. Website: [www.bmi.com](http://www.bmi.com). E-mail: [newyork@bmi.com](mailto:newyork@bmi.com).

**BSI - British Standards Institution**

Standards-setting body representing the United Kingdom in international organizations such as the ITU and the ISO. Address: 389 Chiswick High Road, London W4 4AL, United Kingdom. Tel: 44.0.181.996.9000. Fax: 44.0.181.996.7400. Website: [www.bsi.org.uk](http://www.bsi.org.uk). E-mail: [info@bsi.org.uk](mailto:info@bsi.org.uk).

**BTSC - Broadcast Television Systems Committee**

Technical standards committee working under the auspices of the Electronic Industries Association to develop standards for multi-channel television sound (MTS). (See EIA, MTS)

**CAB - Canadian Association of Broadcasters**

Trade association representing commercial radio and television broadcasters in Canada. Address: Box 627, Station B, Ottawa, Ontario, K1P 5S2 Canada Tel: 613-233-4035. Fax: 613-233-6961. Website: [www.cab-acr.ca](http://www.cab-acr.ca). E-mail: [cab@cab-acr.ca](mailto:cab@cab-acr.ca)

**CABSC - Canadian Advanced Broadcast Systems Committee**

CABSC has been reformed under a new group, the Advanced Broadcast Systems of Canada. (See ABSOC)

**CableLabs - Cable Laboratories Inc.**

Research and development organization and technical testing laboratory supported by leading multiple systems operators (MSOs) of the U.S. cable television industry. Address: 400 Centennial Pkwy., Louisville, CO 80027-1266. Tel: 303-661-9100. Fax: 303-661-9199. Website: [www.cablelabs.com](http://www.cablelabs.com). E-mail: [webmaster@cablelabs.com](mailto:webmaster@cablelabs.com).

**CCIA - Computer and Communications Industry Association**

CCITT - International Telegraph and Telephone Consultative Committee (Comite Consultatif International Telegraphique et Telephonique)

Former name of the ITU Telecommunication Standardization Bureau. Organization concerned with technical telecommunications standards. See ITU.

**CEA - Consumer Electronics Association**

Formerly part of the Electronic Industries Association (EIA), CEA became a separate organization representing the interests of consumer electronics manufacturers. Address: 2500 Wilson Blvd., Arlington, VA 22201. Tel: 703-907-7791. Website: [www.ce.org](http://www.ce.org). E-mail: [cema@ce.org](mailto:cema@ce.org).

**CEMA- Consumer Electronics Manufacturers Association**

Address: 2500 Wilson Boulevard, Arlington, VA 22201. Tel: 703-907-7600. Website: [www.CEMAcity.org](http://www.CEMAcity.org).

**CEN - European Committee for Standardization (Comite Europeen de Normalisation)**

Group which works to eliminate technical barriers to trade through preparation of standards. Address: 36, rue de Stassart, B-1050 Brussels, Belgium. Tel: 2.5.196.811. Website: [www.cenorm.be](http://www.cenorm.be). E-mail: [infodesk@cenorm.be](mailto:infodesk@cenorm.be).

**CENELEC - Comite Europeen de Normalisation / Electronique**

A European standards-setting organization which acts as a liaison for two other standards groups: the International Standards Organization (ISO) and the International Electrotechnical Commission (IEC). The ISO and the IEC cooperate with each other to develop and recommend adoption of technical standards for international electronic networking operations. Address: Rue de Stassart, 35, B-1050 BRUSSELS. Tel: 32.2.519.68.71. Fax: 32.2.519.69.19. Website: [www.cenelec.be](http://www.cenelec.be). E-mail: [general@cenelec.be](mailto:general@cenelec.be).

**CEPT - European Conference of Postal and Telecommunications Administrations**

Organization of countries concerned with strengthening relations between the postal and telecommunications administrations of European countries. Address: P.O. Box 447 Sentrum, N-0104 OSLO, NORWAY. Tel: 47.22.82.48.80. Fax: 47.22.82.48.90. Website: [www.thk.fi](http://www.thk.fi). E-mail: [webmaster@thk.fi](mailto:webmaster@thk.fi).

**CERN - European Committee of Radio Standards**

A European standards policy organization which undertakes to study scientific and related technical issues. Contacts: In Switzerland, CH-1211 Geneva 23, Switzerland; in France: F-01631 CERN Cedex, France. Tel: 41.22.767.6111.

**CES - Consumer Electronics Show**

A annual major trade show organized under the auspices of EIA that is open to the public and providing displays new consumer electronics products. (See EIA) Website: [www.cesweb.org](http://www.cesweb.org).

**CES - Consumer Electronics Society**

A division within the Institute of Electrical and Electronics engineers (IEEE) concerned with the design and manufacture of consumer electronics products. Address: 345 E. 47th St., New York, NY 10017. Tel: 212-705-7900. Website: [www.ieee.org](http://www.ieee.org).

**CIRT - Mexican Association of Broadcasters**

(Camara Nacional de la Industria de Radio y Television de Mexico) Trade association representing the interests of radio and television broadcasters in Mexico. Address: Av. Horacio 1013, Col. Polanco Reforma, 11550 Mexico, D.F. Tel: 52.5.2502122. Website: [www.cirt.com.mx](http://www.cirt.com.mx). E-mail: [cirt@data.net.mx](mailto:cirt@data.net.mx).

**CITI - Clarke Institute for Telecommunications and Information**

A new globally networked and geographically transparent virtual research and education institute for the 21st century. Honorary Chair:

Sir Arthur C. Clarke; Acting Exec. Director, Dr. Joseph N. Pelton, Washington, DC. Tel: 202.994-5509; Email: [iasr@seas.gwu.edu](mailto:iasr@seas.gwu.edu).

**CITEL - Conferencia Interamericana de Telecomunicaciones**

Telecommunications arm of the Organization of States. Address: 1889 F St. NW, Washington, DC 20006. Tel: 202-458-3004. Website: [www.citel.oas.org](http://www.citel.oas.org). E-mail: [citel@oas.org](mailto:citel@oas.org).

**CNET - National Center for Telecommunications Studies**

French organization that approves telecommunications products for sale in France.

**Comptel- Competitive Telecommunications Industry Association**

Address: 1900 M St., NW, Suite 800, Washington, DC 20036. Tel: 202-296-6650. Fax: 202-296-7585. Website: [www.comptel.org](http://www.comptel.org).

**COMSAT - Communications Satellite Corporation**

Currently undergoing privatization, and acquisition of privatized assets by Lockheed Martin Corp. Quasi-governmental segment of Comsat will retain status as U.S. signatory to INTELSAT and INMARSAT. Owns and operates global satellites systems. Address: 6560 Rock Spring Drive, Bethesda, MD 20817. Tel: 301-214-3000. Fax: 301.214.7100. Website: [www.comsat.com](http://www.comsat.com). E-mail: [cicinfo@comsat.com](mailto:cicinfo@comsat.com).

**CREN - Corporation for Research and Education Networking**

A nonprofit organization that operates the U.S. portion of BITNET. The Canadian counterpart is known as NetNorth, and the European counterpart is EARN.

**CRTC - Canadian Radio-Television & Telecommunications Commission**

Federal government regulatory authority for communications. Address: CRTC, 1 Promenade de Portage Hull, Quebec, Canada, K1A 0N2 Tel: (819) 997-0313 (broadcast inquiries.) Website: [www.crtc.gc.ca](http://www.crtc.gc.ca). E-mail: [info@crtc.gc.ca](mailto:info@crtc.gc.ca).

**CSA - Canadian Standards Association**

Organization concerned with safety standards for products in Canada. Address: 178 Rexdale Blvd., Rexdale, Ontario Canada M9W 1R3. Tel: 416-747-4000. Fax: 416-747-4149. Website: [www.csa-international.org](http://www.csa-international.org). E-mail: [certinfo2@csa-international.org](mailto:certinfo2@csa-international.org)

**CTIA - Cellular Telecommunications Industry Association**

Trade association for the cellular telephone and wireless communications industries based in Washington, DC. Address: 1250 Connecticut Ave., NW, Suite 800, Washington, DC 20036. Tel: 202-785-0081. Website: [www.wow-com.com](http://www.wow-com.com).

**CTIA - Computer Technology Industry Association**

Trade association for the computer industry based in Lombard, Illinois.

**DAVIC - Digital Audio-Visual Council**

International group proposing international standard for interactive digital video services, including cable, telcos, satellites. Address: Dr. Leonardo Chiariglione, Multimedia and Video Services, CSELT, Via G. Reiss Romoli, 274, 10148 Torino, Italy. Tel: 39.11.228.6120. Website: [www.davic.org](http://www.davic.org).

**Department of Canadian Heritage**

Canadian office concerned with Canadian broadcasting products and services. One of two agencies replacing the Department of Communications. See also Industry Canada. Address: 15 Eddy St., Hull, Quebec K1A 0M5 Canada. Tel: 819-997-0055.

**DIN - Deutsche Institut fur Normung**

German Institute for Standards responsible for technical electronic and other standards for German businesses, manufacturing, consumer products, etc. Address: Briefpost, 10772 Berlin, Germany. Tel: 011-49-30-26010. Fax: 49-30-2601-1231. Website: [www.din.de](http://www.din.de).

**DOC - Department of Communications (Canadian)**

see Department of Canadian Heritage and Industry (Canada)

**DVD Video Group**

Address: 7758 Sunset Boulevard, Los Angeles, CA 90046. Tel: 323-845-0160. Website: [www.dvdivideogroup.com](http://www.dvdivideogroup.com). E-mail: [getinfo@dvdivideogroup.com](mailto:getinfo@dvdivideogroup.com).

**EBU - European Broadcasting Union**

Organization of broadcasting organizations which provides technical support, legal services, and information exchange. Address: Ancienne Rte. 17A, Case Postale 67, CH-1218 Grand-Saconnex, Switzerland. Tel: 41.22.7172111. Fax: 41.22.747.4033. Website: [www.ebu.ch](http://www.ebu.ch).

**EEA - Electromagnetic Energy Association**

Association of corporations and individuals involved in production, distribution or use of equipment which produces nonionizing electromagnetic energy. Formerly Electromagnetic Energy Policy Alliance. Address: 1255 23rd St. NW, Ste. 850, Washington, DC 20037. Tel: 202-452-1070. Fax: 202-833-3636. Website: [www.oss.net](http://www.oss.net). E-mail: [eea@elecenergy.com](mailto:eea@elecenergy.com).

**EEF - Electronic Frontier Foundation**

Group founded by Mitch Kapor, founder of Lotus Development Corp. and John Perry Barlow, of the Grateful Dead. The EEF is a leading policy group and lobbyist for issues of the digital age. Address: 1550 Bryant Street, Suite 725, San Francisco, CA 94103. Tel: 415-436-9333. Fax: 415-436-9993. Website: [www.eff.org](http://www.eff.org). E-mail: [info@eff.org](mailto:info@eff.org).

**EEPA - Electromagnetic Energy Policy Alliance. (See EEA - Electromagnetic Energy Association)**

EIA - Electronics Industries Alliance  
Trade association representing the interests of U.S. electronics manufacturers. Address: 2500 Wilson Blvd., Arlington, VA 22201. Tel: 703-

907-7500. Website: [www.eia.org](http://www.eia.org). E-mail: [rnichols@eia.org](mailto:rnichols@eia.org)

**ESPRIT - European Strategic Programme for Research and Development in Information Technology**

Information technology research and development program of the Commission of European Communities. Address: c/o Commn. of the European Communities, 200, rue de la Loi, B-1049 Brussels, Belgium. Tel: 2.2351111.

**ETSI - European Telecommunications Standards Institute**

Organization concerned with telecommunications standards for the European Community. Address: Rolute des Lucioles, B.P. 152, Sophia Antipolis Valbonne, Cedex F-06561, France. Tel: 33.0.4.92.94.49.00. Fax: 33.0.4.92.96.03.07. Website: [www.etsi.org](http://www.etsi.org)

**Eureka-147 Project**

Organizing project for development of digital radio system in Europe. Address: Eureka-147 Project Office, c/o DLR e.V., Abt. MD-IT, Linder Höhe, D-51140 Köln, Germany. Project Manager: Werner Kohnert; Tel: +49 2203-968-3334; Fax: +49 2203-968-2866; E-mail: [Werner.Kohnert@dlr.de](mailto:Werner.Kohnert@dlr.de)

**FCC - Federal Communications Commission**

United States regulatory agency created by the Communications Act of 1934. Regulates interstate and foreign communications by radio, television, wire, satellite, and cable. Responsible for allocating and licensing non-government spectrum. Address: 1919 M Street NW, Washington, DC 20554. Tel: 202-418-0200. Fax: 202-418-0232. Website: [www.fcc.gov](http://www.fcc.gov). E-mail: [fccinfo@fcc.gov](mailto:fccinfo@fcc.gov).

**FEMA - Federal Emergency Management Agency**

Central agency with the United States responsible for emergency planning, preparedness, mitigation, response, and recovery. Address: 500 C St., SW, Washington, DC 20472. Tel: 202-646-4600.

**Grand Alliance**

Consortium of partners backing an advanced television broadcast system. Grand Alliance system has been documented and approved as an Advanced Television Systems Committee (ACTV) standard and in 1995 was recommended to the FCC for adoption as the U.S. digital ATV standard. Participants include AT&T, David Sarnoff Research Center, General Instrument, Massachusetts Institute of Technology, Philips Electronics North America Corporation, Thomson Consumer Electronics, and Zenith Electronics Corporation. Website: [www.wral-hd.com](http://www.wral-hd.com).

**IA- Internet Alliance**

Organization of Internet policy professionals who represent the Internet online industry on state, Federal, and international levels. Address: 1825 Eye Street, NW, Suite 400, Washington, DC 20035-5782. Tel: 202-955-8091. Website: [www.internetalliance.org](http://www.internetalliance.org). E-mail: [ia@internetalliance.org](mailto:ia@internetalliance.org).

**IAB - International Association of Broadcasting (Asociacion Internacional de Radiodifusion - AIR)**

International organization representing broadcasters in European and North, Central, and South American countries. Address: 25 de Mayo 520, 11000 Montevideo, Uruguay. Tel: 2.958141.

**IBC - International Broadcasting Convention**

Major European trade show and convention for broadcast businesses and related equipment manufacturers. 1996 IBC convention scheduled for Amsterdam, September 13-17. Address: IBC Convention Office, Savoy Place, London WC2R 0BL United Kingdom. Tel: 44.71.240.3829.

**IBEW - International Brotherhood of Electrical Workers**

Electronics union. Address: 1125 15th St. NW, Washington, DC 20005. Tel: 202-833-7000. Fax: 202-728-6056. Website: [www.ibew.org](http://www.ibew.org). E-mail: [ibewnet@compuserve.com](mailto:ibewnet@compuserve.com).

**ICA - International Communication Association**

Professional association of persons interested in human communication skills and processes. Address: 8140 Burnet Rd., PO Box 9589, Austin, TX 78766. Tel: 512-454-8299. Fax: 512-451-6270. Website: [www.icahdq.org](http://www.icahdq.org). E-mail: [icahdq@uts.cc.utexas.edu](mailto:icahdq@uts.cc.utexas.edu).

**ICA - International Communications Association**

Organization for persons responsible for telecommunications services and facilities. Address: 12750 Merit Dr., Ste. 710, LB-89, Dallas, TX 75251. Tel: 214-233-3889. Website: [www.icanet.com](http://www.icanet.com). E-mail: [information@icanet.com](mailto:information@icanet.com).

**ICIA- International Communications Industries Association**

Provider of education, training and certification for communications technologies. Address: 11242 Waples Mill Road, Suite 200, Fairfax, VA 22030. Tel: 800-659-7469. Website: [www.icia.org](http://www.icia.org).

**IFRB - International Frequency Registration Board**

Technical arbiter (under ITU) of radio frequency allocations as authorized under treaty agreements between countries. These functions now handled by Radiocommunications Sector (RB) of ITU. See ITU- RB.

**IEEE - Institute of Electrical and Electronics Engineers**

Technical professional society promoting development, use and advancement of electrotechnology and allied sciences. Address: 345 East 47th St., New York, NY 10017. Tel: 212-705-7900. Website: [www.ieee.org](http://www.ieee.org). E-mail: [webmaster@ieee.org](mailto:webmaster@ieee.org).

**IIA - Information Industry Association**

Trade association concerned with the generation, distribution, and use of information products, services, and technologies. 555 New Jersey Ave. NW, Ste. 800, Washington, DC 20001.

**IMA - Interactive Multimedia Association**

Trade association concerned with interactive multimedia technology. Address: 48 Maryland Ave., Ste. 202, Annapolis, MD 21401-8011. Tel: 410-626-1380.

**Industry Canada**

Government agency charged with formulating policies and regulations regarding telecommunications, broadcasting, and information technologies, including spectrum allocations. One of two agencies replacing the Department of Communications. See also Department of Canadian Heritage. Address: 235 Queen St., Ottawa Ontario K1A 0H5 Canada. Tel: 613-952-4782.

**INMARSAT - International Mobile Satellite Organization**

An international consortium of nations providing mobile satellite communications for commercial, distress and safety applications, at sea, in air, and on land. Address: 99 City Road, London EC1Y 1AX United Kingdom. Tel: 171.7281000.

**INTELSAT - International Telecommunications Satellite Organization**

Currently undergoing privatization, the worldwide satellite communications consortium originally was organized under international treaty agreement. Address: 3400 International Dr. NW, Washington, DC 20008. Tel: 202-944-7500. Fax: 202-944-7898. Website: [www.intelsat.com](http://www.intelsat.com).

**IRAC - Interdepartment Radio Advisory Committee**

Committee comprised of representatives of U.S. agencies with responsibilities in the allocation and use of all RF spectrum. Administered by National Telecommunications Information Administration. Address: Department of Commerce, 14th St. and Constitution Ave. NW, Room 1605, Washington, DC 20230. Tel: 202-482-0599.

**IrDA - Infrared Data Association**

is an International Organization that creates and promotes interoperable, low cost infrared data interconnection standards that support a walk-up, point-to-point user model. Address: P.O. Box 3883, Walnut Creek, CA 94598. Tel: 925-943-6546. Fax: 925-943-5600. Website: [www.irda.org](http://www.irda.org). E-mail: [info@irda.org](mailto:info@irda.org).

**IRMA- International Recording Media Association**

Advocate for the growth and development of all recording media. Address: 182 Nassau Street, Suite 204, Princeton, NJ 08542-7005. Tel: 609-279-1700. Website: [www.recordingmedia.org](http://www.recordingmedia.org). E-mail: [info@recordingmedia.org](mailto:info@recordingmedia.org).

**ISCET- International Society of Certified Electronics Technicians**

Voluntary certification program for electronics technicians designed to measure the degree of theoretical knowledge and technical proficiency of practicing technicians. Address: 2708 West Barry St., Fort Worth, TX 76109-2397. Tel: 817-921-9101. Website: [www.iscet.org](http://www.iscet.org). E-mail: [a.brown@nesda.com](mailto:a.brown@nesda.com).

**ISO - International Organization for Standardization (Organisation Internationale de Normalisation)**

International organization dedicated to promoting standardization worldwide. Address: 1, rue de Varembe, Case Postale 56, Geneva 20, CH-1211 Switzerland. Tel: 22.7490111.

**ISOG - Inter-Union Satellite Operations Group**

International body of broadcast satellite users and subcommittee of World Broadcasting Unions. Address: 1500 Bronson Ave., Ottawa K1G 3J5 Ontario Canada. Tel: 613-738-6564

**ITA - Interactive Television Association**

Association of organizations, corporations, and individuals interested in interactive television industry. Address: 1030 15th St. NW, Ste. 1053, Washington, DC 20005. Tel: 202-408-0008.

**ITAA - Information Technology Association of America**

Association of companies offering software and services for the public. Address: 1616 N. Fort Meyer Dr., Ste. 1300, Arlington, VA 22209. Tel: 703- 522-5055. Fax: 703-525-2279. Website: [www.ita.org](http://www.ita.org). E-mail: [webmaster@ita.org](mailto:webmaster@ita.org).

**ITIC- Information Technology Industry Council**

Represents U.S. providers of information technology products and services. Address: 1250 Eye Street, NW, Suite 200, Washington, DC 20005. Tel: 202-737-8888. Website: [www.itic.org](http://www.itic.org). E-mail: [webmaster@itic.org](mailto:webmaster@itic.org).

**ITS - Institute of Telecommunication Sciences**

Research and engineering branch of the U.S. National Telecommunications and Information Administration (NTIA). Address: 325 Broadway, Boulder, CO 80303-3328. Tel: 303-497-3500.

**ITU - International Telecommunication Union**

Intergovernmental organization which allocates spectrum (Radiocommunication Sector - BR), fosters telecommunication standardization (Telecommunication Standardization Sector - TSB), and provides information on policy options (Development Sector). Affiliated with the United Nations. Address: Place des Nations 1211, Geneva 20 Switzerland. Tel: 41.22.730.5111. Fax: 41.22.733.7256. Website: [www.itu.int](http://www.itu.int). E-mail: [itumail.itu.int](mailto:itumail.itu.int).

- Radiocommunication Bureau (BR) - formerly CCIR - International Radio Consultative Committee (Comite Consultatif International des Radiocommunications)
- Telecommunication Development Bureau (BDT)
- Telecommunication Standardization Bureau (TSB) - formerly CCITT - International Telegraph and Telephone Consultative Committee (Comite Consultatif International Telegraphique et Telephonique)

**ITVA - International Television Association**

Organization of persons working in videotape and nonbroadcast television fields. Address: 6311 N. O'Connor Rd., Ste. 230, Irving, TX 75039. Tel: 214-869-1112. Fax: 800-801-8926. Website: [www.itva.org](http://www.itva.org). E-mail: [feedback@itva.org](mailto:feedback@itva.org).

**JIWP - Joint Interim Working Party**

Usually refers to a temporary subgroup of a larger industry technical committee or subcommittee that is formed as a working party to examine or manage a specific issue or task. Working parties are to report back findings, determinations, or possible recommendations on an official basis to the larger industry group or committee.

**MHEG - Multimedia and Hypermedia Experts Group**

Mostly European industry group organized to ensure that multimedia applications are portable between different playback environments. Modeled after Motion Picture Experts Group.

**MMB- Mass Media Bureau**

FCC division responsible for regulation of broadcasting. Address: Federal Communications Commission, Room 2-C334, 445 12<sup>th</sup> Street, SW, Washington, DC 20554. Website: [www.fcc.gov/mmb/](http://www.fcc.gov/mmb/). E-mail: [mmbinfo@fcc.gov](mailto:mmbinfo@fcc.gov).

**MMTA - MultiMedia Telecommunications Association**

Association representing the interests suppliers and users of voice and data technology. Formerly North American Telecommunications Association. Address: 2000 M St., NW, Ste. 550, Washington, DC 20036. Tel: 202-296-9800. Fax: 703-907-7478. Website: [www.mmta.org](http://www.mmta.org). E-mail: [info@mmta.org](mailto:info@mmta.org).

**MPPA - Motion Picture Association of America**

Trade organization representing the motion picture industry. Address: 1600 Eye St. NW, Washington, DC 20006. Tel: 202-293-1966. Website: [www.mppa.org](http://www.mppa.org).

**MSTV - Association for Maximum Service Television**

Industry association representing technical spectrum-based interests of commercial television broadcasters. Address: 1776 Massachusetts Ave. NW, Ste. 310, Washington, DC 20036. Tel: 202-861-0344. Fax: 202-861-0342. Website: [www.mstv.org](http://www.mstv.org). E-mail: [mstv@mstv.org](mailto:mstv@mstv.org).

**NAB - National Association of Broadcasters**

Trade association representing radio and television stations and major broadcast networks before Congress, federal agencies, the courts, and international forums. Sponsors two annual trade shows, including one of the world's largest broadcasting and electronics equipment expositions. Address: 1771 N St. NW, Washington, D.C. 20036-2891. Tel: 202-429-5300. Website: [www.nab.org](http://www.nab.org). E-mail: [ssiroky@nab.org](mailto:ssiroky@nab.org).

**NABET - National Association of Broadcast Employees and Technicians-Communications Workers of America.**

Union of workers employed in broadcasting and related industries. Address: 501 3rd St. NW, Washington, DC 20001. Tel: 202-434-1254.

**NABA - North American Broadcasters Association**

Organization representing the interests of broadcast and communications organizations in North America and provides a framework for the identification, study and active solutions to international matters affecting broadcasting. Address: P.O. Box 500, Station A, Toronto, Ontario, Canada M5W 1E6 Tel: 416-598-9877. Website: [www.nabanet.com](http://www.nabanet.com). Email: [info@nabanet.com](mailto:info@nabanet.com).

**NAPTS - National Association of Public Television Stations**

See Association of America's Public Television Stations.

**NARAS - National Academy of Recording Arts and Sciences**

Organization of persons engaged in creative work for production of commercially-released recordings. Address: 3402 Pico Blvd., Santa Monica, CA 90405. Tel: 310-392-3777. Website: [www.grammy.org](http://www.grammy.org).

**NATA - North American Telecommunications Association**

see MultiMedia Telecommunications Association

**NATAS - National Academy of Television Arts & Sciences**

Organization concerned with advancing arts and sciences of television. Sponsors Emmy Awards for non-primetime programming. Address: 111 West 57th St., Rm. 1020, New York, NY 10019. Tel: 212-586-8424 See also Academy of Television Arts and Sciences (ATAS).

**NATE- National Association of Tower Erectors**

Non-profit trade association striving to provide members with uniform safety standards, improved communications, and a unified voice in the tower industry. Address: 420 Fourth St. NE, Suite 109, Watertown, SD 57201-2699. Tel: 888-882-5865. Fax: 605-886-5184. Website: [www.natehome.com](http://www.natehome.com). E-mail: [nate@natehome.com](mailto:nate@natehome.com).

**NATPE - National Association of Television Program Executives**

Membership organization focusing on television programming and production. Address: 2425 Olympic Blvd., Suite 550 E, Santa Monica, CA 90404. Tel: 310-453-4440. Fax: 310-453-5258. Website: [www.natpe.com](http://www.natpe.com). E-mail: [info@natpe.org](mailto:info@natpe.org).

**NCI - National Captioning Institute**

Company which provides closed-captioning service for television industry. Address: 1900 Gallows Rd., Suite 300, Vienna, VA 22182. Tel: 703-917-7600.

**NCSA - National Center for Supercomputing Applications**

A supercomputing center based at the University of Illinois, Champaign-Urbana. Address: 152 Computing Applications Building, 605 East Springfield Avenue, Champaign, IL 61820-5518. Tel: 217-244-0072. Fax: 217-244-1987. Website: [www.ncsa.uiuc.edu](http://www.ncsa.uiuc.edu). E-mail: [rec@ncsa.uiuc.edu](mailto:rec@ncsa.uiuc.edu).

**NCTA - National Cable Television Association**

Trade association representing the cable television industry. Address: 1724 Massachusetts Ave. NW, Washington, DC 20036. Tel: 202-775-3550. Website: [www.ncta.cyberserv.com](http://www.ncta.cyberserv.com).

**NDBC - National Data Broadcasting Committee**

Industry committee founded by National Association of Broadcasters and Electronic Industries Association to develop voluntary national technical standards for high speed broadcasting using the NTSC television service as a delivery media. See NAB and EIA.

**NECA - National Exchange Carrier Association**

Telephone industry association which administers a fund collected from interexchange carriers and distributed to smaller, rural phone companies to help ensure universal telephone service. Address: 100 S. Jefferson Rd., Whippany, NJ 07981. Tel: 201-884-8000. Fax: 973-884-8469. Website: [www.neca.org](http://www.neca.org). E-mail: [webmast@neca.org](mailto:webmast@neca.org).

**NHK - Nippon Hoso Kyokai (Japan Broadcasting Corporation)**

Public broadcasting corporation known for its research and development of new technologies. Active in development of HDTV and DBS. Address: 2-2-1 Jinnan Shibuya-ku, Tokyo 150-01, Japan. Tel: 81.3.3465.1111.

**NIST - National Institute of Standards and Technology**

Division of the Department of Commerce which promotes U.S. economic growth by

working with industry to develop and apply technology, measurements, and standards. Address: Bldg. 101, Rte. 270, Gaithersburg, MD 20899. Tel: 301-975-3058. Website: [www.nist.gov](http://www.nist.gov). E-mail: [inquiries@nist.gov](mailto:inquiries@nist.gov).

**NOAA - National Oceanographic and Atmospheric Administration**

Division of the Department of Commerce which monitors conditions in the atmosphere. Address: 14th & Constitution Ave. NW, Washington, DC 20230. Tel: 202-482-2985. Fax: 202-482-3154. Website: [www.noaa.gov](http://www.noaa.gov). E-mail: [help@esdim.noaa.gov](mailto:help@esdim.noaa.gov).

**NPR - National Public Radio**

Organization which produces and distributes programming to member public radio stations. Address: 635 Massachusetts Ave. NW, Washington, DC 20001-3753. Tel: 202-414-2000. Fax: 202-414-3329. Website: [www.npr.org](http://www.npr.org). E-mail: [webmaster@npr.org](mailto:webmaster@npr.org).

**NREN - NASA Research and Education Network**

U.S.-based research effort to combine different federal agency networks into a single high-speed network several times faster than previous Internet speeds. Website: [www.nren.nasa.gov](http://www.nren.nasa.gov). E-mail: [nren@mail.arc.nasa.gov](mailto:nren@mail.arc.nasa.gov).

**NRSC - National Radio Systems Committee**

Industry committee sponsored by the National Association of Broadcasters and the Electronic Industries Association which works to develop technical standards to improve the radio broadcast system, including AM transmission and reception and the Radio Broadcast Data System (RBDS). (See EIA, NAB) Website: [www.nab.org](http://www.nab.org). E-mail: [dlayer@nab.org](mailto:dlayer@nab.org).

**NSCA - National Systems Contractors Association**

Association that represents the commercial electronics systems industry. Address: 419 First St. SE, Cedar Rapids, IA 52401. Tel: 800-446-6722. Fax: 319-366-4164. Website: [www.nasca.org](http://www.nasca.org).

**NTCA - National Telephone Cooperative Association**

Trade association representing small, usually rural telephone companies. Address: 4121 Wilson Blvd., Tenth Floor, Arlington, VA 22203. Tel: 703-351-2000. Fax: 703-351-2001  
 Website: [www.ncta.org](http://www.ncta.org).  
 E-mail: [contact@ncta.org](mailto:contact@ncta.org).

**NTIA - National Telecommunications and Information Administration**

Division of the Department of Commerce which serves as principal executive branch adviser to the President on Telecommunications and information policy, develops U.S. policies at international communications conferences, prescribes policies for managing federal use of the radio frequency spectrum, and serves as the principal federal telecommunications research and engineering laboratory through Institute for Telecommunication Sciences (ITS). Address: 14th & Constitution Ave. NW, Washington, DC 20230. Tel: 202-482-1551. Website: [www.ntia.doc.gov](http://www.ntia.doc.gov).

**NTIS - National Technical Information Service**

Self-supporting government clearinghouse within the Department of Commerce for scientific, technical, engineering, and other business-related information. Address: Forbes Bldg., 5285 Port Royal Rd., Springfield, VA 22161. Tel: 703-487-4650. Website: [www.ntis.gov](http://www.ntis.gov). E-mail: [info@ntis.fedworld.gov](mailto:info@ntis.fedworld.gov).

**NTSC - National Television Systems Committee**

Committee which established the existing television broadcast television monochrome and color standards used in the United States, Canada, Mexico, Japan, and many Latin American countries.

**NWS - National Weather Service**

Field organization within the National Oceanic and Atmospheric Administration which reports the weather of the United States. Address: National Meteorological Center, Office of Public Affairs, 1325 East-West Highway, Room 18454, Silver Spring,

MD 20910. Website: [www.nws.noaa.gov](http://www.nws.noaa.gov). E-mail: [w-ns.webmaster@noaa.gov](mailto:w-ns.webmaster@noaa.gov)

**OET - Office of Engineering and Technology**

FCC division which administers Table of Frequency Allocations, Experimental Radio Service, and Equipment Authorization Program. Address: 2000 M St. NW, Washington, DC 20554. Tel: 202-418-2470. Fax: 202-418-1944. Website: [www.fcc.gov/oet/](http://www.fcc.gov/oet/). E-mail: [oetinfo@fcc.gov](mailto:oetinfo@fcc.gov).

**OPASTCO - Organization for the Promotion and Advancement of Small Telecommunications Companies**

Association representing more than 500 small, independently owned local exchange carriers and their affiliate companies. Website: [www.opastco.org](http://www.opastco.org).

**PBS - Public Broadcasting Service**

Program distribution company concerned with public television stations. Address: 1320 Braddock Place, Alexandria, VA 22314-1698. Tel: 703-739-5000. Website: [www.pbs.org](http://www.pbs.org). E-mail: [www@pbs.org](mailto:www@pbs.org).

**PCIA - Personal Communications Industry Association**

International trade association representing the personal communications services industry. Address: 500 Montgomery St., Suite 700, Alexandria, VA 22314. Tel: 703-739-0300. Fax: 703-836-1608. Website: [www.pcia.com](http://www.pcia.com).

**SAG - Screen Actors Guild**

Actors union. Address: 5757 Wilshire Blvd., Los Angeles, CA 90036-3600. Tel: 213-549-6400. Fax: 323-549-6603. Website: [www.sag.org](http://www.sag.org). E-mail: [saginfo@sag.org](mailto:saginfo@sag.org).

**SBCA - Satellite Broadcasting Communications Association**

Trade organization representing all aspects of the satellite industry. Address: 225 Reinekers lane, Suite 600, Alexandria, VA 22314. Tel: 703-549-6990. Website: [www.sbca.com](http://www.sbca.com). E-mail: [info@sbca.org](mailto:info@sbca.org).

**SCIA - Smart Card Industry Association**

Association for the smart card industry to serve the educational and networking needs, as well as serve as the common voice for the industry. Address: 191 Clarksville Road, Lawrenceville, NJ 08648. Tel: 800-848-SCIA. Website: [www.scia.org](http://www.scia.org). E-mail: [info@scia.org](mailto:info@scia.org).

**SCTE - Society of Cable Telecommunications Engineers**

Address: 140 Philips Road, Exton, PA 19341. Tel: 610-363-6888 or 800-542-5040. Fax: 610-363-5898. Website: [www.scte.org](http://www.scte.org). E-mail: [scte@scte.org](mailto:scte@scte.org).

**SESAC**

Music licensing organization. Address: 55 Music Square E., Nashville, TN 37203. Tel: 615-320-0055. Fax: 615-320-0055. Website: [www.sesac.com](http://www.sesac.com).

**SIA - Satellite Industry Association**

Trade organization representing U.S. space and communications companies in the commercial satellite arena. Address: 225 Reinekers Lane, Suite 600, Alexandria, VA 22314. Tel: 703-549-8697. Website: [www.sia.org](http://www.sia.org). E-mail: [cmowry@sbca.org](mailto:cmowry@sbca.org).

**SIIA - Software Information Industry Association**

Trade association for the software and digital content industry. Provides global services in government relations, business development, corporate education, and intellectual property protection. Address: 1730 M St., NW, Suite 700, Washington, DC 20036-4510. Tel: 202-452-1600. Website: [www.siia.net](http://www.siia.net).

**SIGGRAPH - Special Interest Group on Computer Graphics**

Under the auspices of the Association for Computing Machinery, a membership organization for those working in computer graphics. Address: 1515 Broadway, 17th Fl., New York, NY 10036. Tel: 212-869-7440. Fax: 212-944-1318. Website: [www.siggraph.org](http://www.siggraph.org). E-mail: [shreiner@siggraph.org](mailto:shreiner@siggraph.org).

**SMPTE - Society of Motion Picture and Television Engineers**

Organization concerned with technical standards in film, television, and video. Address: 595 West Hartsdale Ave., White Plains, NY 10607-1224. Tel: 914-761-1100. Fax: 914-761-3115. Website: [www.smpte.org](http://www.smpte.org). E-mail: [smpte@smpte.org](mailto:smpte@smpte.org).

**TASO - Television Allocations Study Organization**

Industry organization concerned with television channel allocations. Active in the 1950=s.

**TIA - Telecommunications Industry Association**

Sector of the Electronic Industries Association which represents companies providing goods and services to the telecommunications industry. Address: 2500 Wilson Blvd., Arlington, VA 22201. Tel: 703-907-7700. Fax: 703-907-7727. Website: [www.tiaonline.org](http://www.tiaonline.org). E-mail: [tia@tia.eia.org](mailto:tia@tia.eia.org).

**TOC - Television Operators Caucus**

Organization representing large full-service commercial television stations. Address: 901 31st Street NW, Washington, DC 20007-4423. Tel: 202-944-5109.

**TRA - Telecommunications Resellers Association**

Represents companies involved in the resale of telecommunications services. Address: 1401 K St., NW, Suite 600, Washington, DC 20005. Tel: 202-835-9898. Fax: 202-835-9893. Website: [www.tra.org](http://www.tra.org).

**UL - Underwriters Laboratory**

Independent, non-profit product safety testing and certification organization. Address: 333 Pfingsten Road, Northbrook, IL 60062-2096. Tel: 847-272-8800. Fax: 847-272-8129. Website: [www.ul.com](http://www.ul.com). E-mail: [northbrook@ul.com](mailto:northbrook@ul.com).

**USTA - United States Telephone Association**

Trade association representing local telephone companies or telephone holding companies. Address: 1401 H St. NW, Ste. 600, Washington, DC 20005-2136. Tel: 202-326-7300.

**VESA - Video Electronics Standards Association**

Association which promotes technical standards regarding video transmissions formats. Address: 2150 N. First St., Ste. 440, San Jose, CA 95131-2029. Tel: 408-435-0333. Fax: 408-435-8225. Website: [www.vesa.org](http://www.vesa.org). E-mail: [webmaster@vesa.org](mailto:webmaster@vesa.org).

**WGAE - Writers Guild of America, East**

Labor union for writers in motion pictures, television, cable, radio, and new technologies. Address: 555 W. 57th St., Ste. 1230, New York, NY 10019. Tel: 212-767-7800. Fax: 212-582-1909. Website: [www.wgaeast.org](http://www.wgaeast.org).

**WGAW - Writers Guild of America, West**

Labor union for writers in motion pictures, television, cable, radio, and new technologies. Address: 8955 Beverly Blvd., West Hollywood, CA 90048. Tel: 310-550-1000. Website: [www.wga.org](http://www.wga.org).

**WRC - World Radiocommunication Conference**

International conferences held every two years under the auspices of the International Telecommunication Union to consider changes to radio regulations and the international table of frequency allocations. Replaces WARC. (See ITU)

# INDEX

## Number Terms

2B + D .....	1
3G .....	1
8 VSB/6 VSB .....	2
0 Base-T .....	2
24/7 .....	2
50 Hz/60 Hz .....	2
56k Line .....	2
64 kbps .....	2
00 Base-T .....	2
700 MHz Auction .....	2
394/5C Protocol .....	3
<b>A</b>	
A&B Signaling .....	4
A/B Rolls .....	4
A/B Switch .....	4
A/D - Analog to Digital Conversion .....	4
A/V - Audio/Visual .....	4
AC-3 .....	5
AC Power .....	5
Accelerated Graphics Port (AGP) .....	5
Access Code .....	5
Access Node .....	5
Account .....	5
Accunet .....	5
Acoustic Coupler .....	5
Acrobat™ .....	6
ActiveX™ .....	6
Active Matrix .....	6
Active Matrix Display .....	6
Active Server Pages™ (ASP) .....	6
Active Video Lines .....	7
ACTS - Advanced Communications Technology Satellite .....	7

ACTV - Advanced Compatible Television .....	8
ACU - Automatic Calling Unit .....	8
Ad Banner .....	8
Ad View .....	8
Adapter Card .....	9
Adaptive Routing .....	9
ADC - Analog to Digital Converter .....	9
ADCT - Adaptive Discrete Cosine Transform .....	9
Address .....	9
Addressability .....	9
Adjacent Channel Interference .....	9
ADSL - Asymmetrical Digital Subscriber Line .....	9
Advanced Basic Input/Output System (ABIOS) .....	10
Advanced Encryption Standard .....	10
Advanced Technology Bus (AT Bus) .....	10
Agent .....	11
AI - Artificial Intelligence .....	11
AIFF (Audio Interchange File Format) .....	11
AIN - Advanced Intelligent Network .....	11
Alias .....	11
Aliasing .....	11
Algorithm .....	12
Alphanumeric .....	12
ALT - Alternative Exchange Carrier .....	12
Alt Key .....	12
Alternate Routing .....	12
AM - Amplitude Modulation .....	13
AMAX .....	13
Ambient Noise .....	13
AM Expanded Band .....	13
Ampere .....	13
Amplifier .....	14
Amplitude Shift Keying .....	14
Analog .....	14

ANI - Automatic Number Identification ....	14	Authentication .....	21
Animated GIF .....	14	Authoring .....	22
Anonymous FTP .....	14	Authoring Tools .....	22
Anonymous Remailer .....	14	Automatic Call Distributor (ACD) .....	22
Antenna Farm .....	15	Autoresponder .....	22
Antenna Gain .....	15	Autosave .....	22
Anti-Aliasing .....	15	AutoVision .....	22
Anti-Virus Software .....	15	AUX - Auxiliary .....	22
Apache Web Server .....	15	Avatar .....	22
APD - Avalanche Photodiode .....	16	AVI - Audio Video Interleaved .....	23
API - Application Program Interface .....	16	Axis .....	23
Apogee .....	16	Azimuth .....	23
Applet .....	16		
Application .....	16	<b>B</b>	
Application Layer .....	16	B2B .....	24
Application Service Provider (ASP) .....	16	B-Channel - Bearer Channel .....	24
Application Sharing .....	16	B-ISDN - Broadband ISDN .....	24
Archie .....	17	.bmp .....	24
Architecture (Open/Closed) .....	17	Baby Bells .....	24
Archive .....	17	Back Channel .....	24
ARPANet -Advanced Research Projects .....	17	Back Door .....	24
Agency Network .....	17	Backbone Network .....	24
Array .....	17	Backlighting .....	25
Artifacts .....	17	Backward-Compatibility .....	25
Artificial Intelligence .....	17	Band .....	25
ASCII - American Standard Code for Information Interchange .....	17	Band-Pass Filter .....	25
ASIC - Application Specific Integrated Circuit .....	18	Bandwidth .....	26
Aspect Ratio .....	18	Banner Ad .....	27
Asymmetrical .....	18	Baseband .....	27
Asymmetrical Compression .....	18	BASIC - Beginners All-purpose Symbolic Instruction Code .....	27
Asynchronous .....	18	Basic Trading Area (BTA) .....	27
ATM - Asynchronous Transfer Mode .....	19	Batch File .....	28
Attachment .....	19	BBS - Bulletin Board Service .....	28
Attenuation .....	19	BCC - Blind Carbon Copy .....	28
Attenuator .....	19	BCD - Binary Coded Decimal .....	28
ATVEF - Advanced Television Enhancement Forum .....	19	Beam Splitter .....	28
Auction .....	19	Bellcore .....	28
Audible Tones .....	21	Bell Laboratories .....	28
Audit Trail .....	21	Benchmark .....	28
AUI - Attachment Unit Interface .....	21	BER - Bit Error Rate .....	29
		Betacam SP .....	29

Beta Test .....	29	Bundle .....	36
Bezel .....	29	Bundling .....	36
Binary .....	29	Burst .....	37
Binary Numbering .....	29	Bursty Data .....	37
BINHEX - BINary HEXidecimal .....	29	Bus .....	37
BIOS - Basic Input/Output System .....	29	Bypass Networks/Bypass Services .....	37
Bird .....	30	Byte .....	37
Bird Time .....	30		
Bit .....	30	<b>C</b>	
Bit Density .....	30	C .....	38
Bitmap .....	31	C++ .....	38
BITNET - Because It's Time Network .....	31	C7 .....	38
Bit Stream Transmission .....	31	C-Band .....	38
Black Box .....	31	C/I - Carrier-to-Interference Ratio .....	38
Black Burst .....	31	C/N - Carrier-to-Noise Ratio .....	38
Blanking Intervals .....	32	CA - Certification Authority .....	39
Bloatware .....	32	CAA - Computer Augmented Acceleration .....	39
Block .....	32	Cable .....	39
Bluetooth .....	32	Cable Internet Access .....	40
BNC Connector .....	32	Cable Modem .....	41
Board .....	32	Cable Radio .....	41
Bookmarks/Favorites .....	33	Cable Television .....	41
Boolean Search .....	33	Cache .....	41
Boot or Boot-Up .....	33	CAD/CAM - Computer Aided Design / Computer Aided Manufacture .....	41
BOS - Broadband On-Screen .....	33	Caller ID .....	42
Bot .....	33	Call Tree .....	42
Bottleneck .....	33	CAN - Campus Area Network .....	42
bps - Bits Per Second .....	34	CAP - Competitive Access Provider .....	42
BPSK - Binary Phase-Shift Keying .....	34	Capacitance .....	42
BRI - Basic Rate Interface .....	34	Capacitor .....	42
Bridge .....	34	Capacity .....	42
Bridge Amplifier .....	34	Card .....	43
Brightness .....	34	Carrier .....	43
Broadband .....	34	Carrier Wave .....	43
Broadband Wireless Access .....	35	Carterfone Decision of 968 .....	43
Broadcast .....	36	Case Sensitivity .....	43
Broadcast PC .....	36	Castanet™ .....	43
Broadcast Quality .....	36	CAT-5 .....	44
Brouter .....	36	Cathode Ray Tube .....	44
Browser .....	36	CATV - Community Antenna Television ....	44
BSS - Broadcast Satellite Service .....	36		
Buffer .....	36		

CC - Closed Captioning .....	44	Clear Channel .....	52
CCD - Charge Coupled Device .....	44	Click-and-Mortar .....	52
CD - Compact Disc .....	44	Click-Through Rate .....	52
CD Quality .....	44	Client/Server .....	53
CD-I - Compact Disc - Interactive .....	44	Clipboard .....	53
CD-R/CDR - Compact Disc - Recordable .....	45	Clipper Chip .....	53
CD-ROM - Compact Disc Read- Only-Memory .....	45	Clock /Clock Speed .....	54
CD-ROM-XA - Compact Disc Read-Only .....	45	Closed Captioning (CC).....	54
Memory eXtended Architecture .....	45	Closed System .....	54
CD-V - Compact Disc Video.....	45	Closed User Group.....	54
CD-WO - CD-Write Once .....	45	CMOS - Complementary Metal Oxide Semiconductor .....	54
CDMA - Code Division Multiple Access ....	45	CMRS - Commercial Mobile Radio Service .....	54
CDPD - Cellular Digital Packet Data .....	46	CMYK (Cyan, Magenta, Yellow Key) .....	54
CDV - Compressed Digital Video.....	46	CO - Central Office .....	55
Cell .....	46	Coax/Coaxial Cable .....	55
Cellphone Market .....	46	COBOL - Common Business Oriented Language .....	56
Cellular Telephone .....	48	Code .....	56
Central Office .....	48	CODEC - COder/DECoder .....	56
Centrex .....	48	COFDM - Coded Orthogonal Frequency Division Multiplexing .....	56
CFR - Code of Federal Regulations .....	49	ColdFusion™ .....	56
CG - Character Generator .....	49	Collision .....	56
Challenge-Response .....	49	Color .....	56
Channel .....	49	Color Burst .....	57
Character-Oriented .....	49	Command Prompt .....	57
Chat .....	49	Common Carrier .....	57
Chat Room .....	49	Common Gateway Interface (CGI) .....	57
Chip .....	50	Component Video .....	57
Chipset .....	50	Composite Video .....	57
Chroma Key .....	50	Compressed Video .....	58
Chrominance .....	50	Compression .....	58
Churn .....	50	Compression Algorithm .....	58
CIF - Common Interface Format .....	51	Compulsory License .....	59
CIFS (Common Internet File System) .....	51	Computer .....	59
CIM - Computer-Integrated Manufacturing .....	51	Computer-Mediated Communication (CMC) .....	59
Circuit .....	51	Comsat - Communications Satellite Corporation .....	59
Circuit Switching .....	51	Conditioning .....	59
Cladding .....	51	Conductivity .....	60
Clarke Belt .....	51	Connection .....	60
CLASS - Custom Local Area Signaling Service.....	52		

Connectionless Network .....	60	Data Communications .....	69
Connectivity .....	60	Data Link .....	69
Content Provider .....	60	Data Mining .....	69
Control Key .....	61	Data Packet .....	69
Controller .....	61	Data Rate .....	70
CONUS .....	61	Data Stream .....	70
Convergence .....	61	Data Vaulting .....	70
Converging .....	62	Data Warehousing .....	70
Cookie .....	62	Database .....	71
Co-processor .....	63	Database Server .....	71
Core .....	63	Datacasting .....	71
CPE - Customer Premises Equipment .....	63	Datasuit .....	73
CPM - Characters Per Minute .....	63	Daughterboard .....	73
CPU - Central Processing Unit .....	63	DAVIC .....	73
Crawl .....	63	dB - Decibel .....	73
Cream Skimming .....	63	DBS - Direct Broadcast Satellites .....	74
Cross Connect .....	64	DCC - Digital Compact Cassette .....	75
Cross-Platform .....	64	DC Power .....	75
Crosstalk .....	64	DCT - Discrete Cosine Transform .....	76
CRT - Cathode Ray Tube .....	64	Debugging .....	76
CSU - Channel Service Unit .....	64	Decoder .....	76
CTI - Computer Telephone Integration .....	64	Decryption .....	76
CTS - Clear to Send .....	64	Dedicated Line .....	76
Current (Electrical) .....	65	DeepSee .....	76
CU-SeeMe .....	65	Defrag .....	77
CV - Composite Video .....	65	Demarcation Point (Demarc).....	77
CyberCash .....	65	Demodulation .....	77
Cyberpunk .....	65	Demultiplexing (DeMUX) .....	77
Cyberspace .....	65	Dense Wave Division Multiplexing - DWDM .....	77
Cybersquatting .....	66	Density .....	77
Cycles per Second .....	66	Deregulation .....	77
<b>D</b>			
D/A - Digital /Analog .....	67	Desktop Publishing (DTP) .....	77
DAB - Digital Audio Broadcasting .....	67	Desktop Videoconferencing .....	78
DAC - Digital to Analog Converter/ Conversion .....	67	Device Manager .....	78
Daisychain .....	67	DGPS - Differential Global Positioning System .....	78
Dark Fiber .....	67	Digerati .....	78
DAT - Digital Audio Tape .....	67	Digital .....	79
Data .....	68	Digital Camera .....	79
Data Broadcasting .....	68	Digital Certificate /Digital IDs .....	80
		Digital Copyright .....	80
		Digital Data Units of Measures .....	80

Digital Divide .....	80	Download .....	88
Digital Media .....	81	Downtime .....	89
Digital Signatures .....	81	DPCM - Differential Pulse Code Modulation .....	89
Digital Versatile Disk .....	81	DPSK - Differential Phase-Shift Keying ....	89
Digital Video Broadcasting .....	81	DQPSK - Differential Quaternary Phase-Shift Keying (4 PSK) .....	89
Digital Video Disk .....	81	Drag and Drop .....	89
Digital Video Effects .....	81	DRAM - Dynamic Random Access Memory .....	89
Digital Watermark .....	81	Driver .....	89
DIN - Deutsche Institut fur Normung .....	81	Drop .....	90
Diode .....	81	DSL - Digital Subscriber Line .....	90
Dip Switch .....	81	DS-0 - Digital Signaling - Zero Level .....	92
DirecPC .....	82	DSP - Digital Signal Processing .....	92
DirectDraw™ .....	82	DSS™ - Digital Satellite System .....	92
DirecTv .....	82	DSU - Digital Service Unit .....	92
Directional Antenna .....	82	DTE - Data Terminal Equipment .....	92
Disc .....	83	DTH - Direct-to-Home .....	92
Discontinuity .....	83	DTV - Digital Television .....	93
Discrete .....	83	DTV Sets .....	93
Dish .....	83	Dubbing .....	93
Disintermediation .....	83	Dumb Terminal .....	93
Disk .....	84	Duplex Communication .....	94
Disk Cache .....	84	DVB - Digital Video Broadcasting .....	94
Display .....	84	DVD - Digital Versatile Disc .....	94
Dissolve .....	84	DVD-RW - Digital Video Disk- Recordable/Writeable .....	94
Distance Learning .....	84	DVE - Digital Video Effects .....	94
Distortion .....	85	DVI - Digital Video Interactive .....	94
Distributed System .....	85	DVI-CD-ROM - Digital Video Interactive CD-ROM .....	94
Divestiture .....	85	Dvorak Keyboard .....	94
Divx™ .....	85	DVS - Descriptive Video Service .....	95
DJ - Disk Jockey .....	85	Dynamic Bandwidth Allocation .....	95
DLL - Dynamic Link Library .....	85	DYUV - Delta YUV .....	95
DM - Delta Modulation .....	86		
DMA - Designated Market Area .....	86	<b>E</b>	
Docking Station .....	86	E-Business .....	96
DoCoMo .....	86	E-Cash - Electronic Cash .....	96
Dolby .....	87	E-Commerce .....	96
Domain Name .....	87	E-mail .....	98
Dongle .....	87	E-mail Attachment .....	98
DOS - Disk Operating System .....	87		
DoS Attack - Denial of Service Attack .....	88		
Dot.com .....	88		
Dot Pitch .....	88		
Downlink .....	88		

E-Port .....	98
Earth Station .....	98
EAS - Emergency Alerting System .....	99
Eb/No - Bit Energy to Noise Density Ratio .....	99
EDAC - Error Detection and Correction .....	99
EDI - Electronic Data Interchange .....	99
Editing .....	99
EFS - Error Free Seconds .....	99
Egress .....	99
EHF - Extremely High Frequency .....	100
EIA Interface .....	100
EIDE - Enhanced Integrated Drive Electronics .....	100
EIRP - Effective Isotropic Radiated Power .....	100
EISA - Extended Industry Standard Architecture .....	100
Electromagnetic Spectrum .....	100
Electronic Coupons .....	100
EDI - Electronic Data Interchange .....	100
Electronic Media Market .....	101
Electronic Newsletter .....	101
Electronic Organizer .....	101
Electronic Paper .....	102
Electronic Payment System .....	102
Electronic Wallet .....	102
ELF - Extremely Low Frequency .....	102
Ellipso .....	102
Elliptical Orbit .....	103
EMI - Electromagnetic Interference .....	103
Emoticons .....	103
EMP - Electromagnetic Pulse .....	103
Emulation .....	103
Encoding/Decoding .....	104
Encrypted "Containers" .....	104
Encryption .....	104
ENG - Electronic Newsgathering .....	104
Enterprise-wide .....	104
Environment .....	104
EPG - Electronic Program Guide .....	104
Equalizer .....	105
Erase Head .....	105

Ergonomics .....	105
Erlang .....	105
ERP - Enterprise Resource Planning .....	105
Error Correction .....	105
Error Rate .....	105
Escape Character .....	106
ESMR - Enhanced Specialized Mobile Radio .....	106
ESS - Electronic Switching System .....	106
Ethernet .....	106
ETV - Educational Television .....	106
Eureka - European Research Coordination Agency .....	107
Eureka-47 .....	107
Exchange Server™ .....	107
Expansion Slots .....	107
Expert System .....	107
Extranet .....	107

## E

Facility .....	108
FAQ - Frequently Asked Questions .....	108
Fast Ethernet .....	108
Fast Packet Switching .....	108
FAT - File Allocation Table .....	108
FAX - Facsimile .....	108
FAX Modem .....	108
FDDI - Fiber Distributed Data Interface .....	109
FDDI 2 .....	109
FDMA - Frequency Division Multiple Access .....	109
FEC - Forward Error Correction .....	109
FED - Field Emission Display .....	109
Feedback .....	110
FEP - Front End Processor .....	110
Fiber Optics .....	110
Field .....	110
Field Frequency .....	110
Field Rate .....	111
FIFO - First In, First Out .....	111
File .....	111
File Extension Label .....	111

- File Server ..... 111
- Filter ..... 111
- Finger ..... 112
- FIPS - Federal Information  
Processing Standards ..... 112
- Firewall ..... 112
- FireWire ..... 112
- Firmware ..... 112
- Flag ..... 112
- Flame ..... 112
- Flash™ ..... 113
- Flash Memory ..... 113
- Flat Panel Display ..... 113
- Flicker ..... 113
- Floppy Disk ..... 113
- Floptical ..... 113
- Flyaways ..... 114
- FM - Frequency Modulation ..... 115
- FMV - Full-Motion Video ..... 115
- Footprint ..... 115
- Fourier Transform ..... 115
- fps - Frames Per Second ..... 115
- Fractal Compression ..... 116
- Fractals ..... 116
- Frame ..... 116
- Frame Buffer ..... 116
- Frame Grabber ..... 116
- Frame Rate ..... 116
- Frame Relay ..... 116
- Frame Store ..... 116
- Frames ..... 117
- Freeware ..... 117
- Frequency ..... 117
- Frequency Allocation ..... 117
- Frequency Allocations Table ..... 119
- Frequency Division Multiplexing ..... 119
- Frequency Hopping ..... 119
- Frequency Modulation ..... 119
- Frequency Response ..... 119
- Frequency Re-use ..... 119
- FSK - Frequency Shift Keying ..... 120
- FSS - Fixed Satellite Service ..... 120
- FTP - File Transfer Protocol ..... 120
- FTTC - Fiber-To-The-Curb ..... 120
- FTTH - Fiber-To-The-Home ..... 120
- Full Duplex ..... 120
- Full-Motion Video ..... 121
- Fuzzy Logic ..... 121
- G**
- Gain ..... 122
- Gateway ..... 122
- Gbps - Gigabits per second ..... 122
- GCR - Gho Canceling Reference Signal .. 122
- Generation ..... 122
- Geostationary Orbit ..... 122
- GIF - Graphics Interface Format ..... 124
- Gigabit (Gb) ..... 124
- Gigabit Ethernet ..... 124
- Gigabyte (GB) ..... 124
- Gigahertz (GHz) ..... 124
- Gigapop ..... 124
- GII - Global Information Infrastructure ... 124
- GIS - Geographic Information Services .... 124
- Globalstar ..... 125
- GMT - Greenwich Mean Time ..... 125
- Gopher ..... 126
- GPI Trigger - General Purpose  
Interface Trigger ..... 126
- GPS - Global Positioning System) ..... 126
- Grade B Contour ..... 126
- Grand Alliance ..... 127
- Graphics ..... 128
- Graphics Adapter ..... 128
- Ground ..... 128
- Groupware ..... 129
- GSM - Global Systems for Mobile  
Communications ..... 129
- GSO - Geostationary Orbit ..... 129
- GUI - Graphical User Interface ..... 129
- GW - Ground Wave ..... 129
- H**
- HAAT - Height Above Average Terrain .... 130

Hacker .....	130	Hypermedia .....	137
Handheld .....	130	Hypertext .....	137
Handset .....	130	Hz - Hertz .....	137
Handshaking .....	130		
Handwriting Recognition .....	130	<b>I</b>	
Hard Disk .....	131	I/O - Input/Output .....	138
Hard Drive .....	131	IA - Intelligent Agent .....	138
Hardware .....	131	IBOC - In-Band On-Channel .....	138
Harmonic Distortion .....	131	IC - Integrated Circuit .....	139
Harmonics .....	131	ICMP - Internet Control Message Protocol .....	139
HARP - High-gain Avalanche Amorphous Photoconductor .....	131	ICO .....	139
HASL - Height Above Mean Sea Level ....	132	Icon .....	139
HBI - Horizontal Blanking Interval .....	132	ICQ™ .....	139
HDSL - High-bit rate Digital Subscriber Loop .....	132	ICraveTV .....	139
HDTV - High Definition Television .....	132	ID .....	140
Headend .....	132	Image Map .....	140
Header .....	132	Image Processing .....	140
Hercules .....	133	IMAP - Internet Message Access Protocol .....	140
Hertz (Hz) .....	133	Impedance (Z) .....	140
Hexadecimal .....	133	In-Band Signaling .....	140
HF - High Frequency .....	133	Inclined Orbit .....	140
HFC - Hybrid Fiber Coax .....	133	Incremental Backup .....	140
High-Performance Computing .....	133	Indeo Video .....	141
High-Speed FM .....	133	Information Appliance .....	141
High-Speed Subcarriers .....	134	Information Metering .....	141
Hit .....	134	Information Provider - IP .....	141
HLT - Home Linking Technology .....	134	Information Superhighway .....	141
Holographic Signatures .....	134	Infrared .....	141
Home Automation .....	134	Infrastructure .....	142
Home Page .....	134	Initial Public Offering - IPO .....	142
Host Computer .....	135	INMARSAT - International Maritime Satellite Organization .....	142
Hosting .....	135	Input .....	142
Hot Spot .....	135	Insert Editing .....	142
HPA - High-Power Amplifier .....	135	Install/Uninstaller .....	142
HTML - Hypertext Markup Language .....	136	Instant Messaging (IM) .....	143
HTTP - Hypertext Transport Protocol ....	136	Integrated Voice Data .....	143
Hub .....	136	Intellectual Property .....	143
Hue .....	136	Intelligent Homes .....	143
Hybrid Network .....	136	INTELSAT LLC .....	143
HyperCard .....	137		
Hyperlink/Link .....	137		

Interactive .....	143	IVHS - Intelligent Vehicle Highway System .....	154
Interactive Television (ITV) .....	144	IX .....	154
Interactive Video .....	144	IXC .....	154
Interconnect .....	144		
Interexchange Carrier (IXC) .....	144	<b>I</b>	
Interface .....	144	Jack .....	155
Interference .....	144	Java™ .....	155
Interlace Scanning .....	145	JavaScript .....	155
Inter-LATA .....	145	Jaz Disks/Jaz Drives .....	155
Interleaving .....	145	Jitter .....	155
Internet .....	146	Joint Electronic Payment Initiative (JEPI) .....	155
Internet 2 .....	146	JPEG - Joint Photographic Experts Group Graphics) .....	155
Internet Address .....	146		
Internet Advertising .....	147	<b>K</b>	
Internet Appliances .....	148	k - Kilo .....	156
Internet Keyed Payment (IKP) .....	148	Ka-Band .....	156
Internet Protocol .....	148	kbps - Kilobits per Second .....	156
Internet Service Provider .....	148	Kermit .....	156
Internet User Market .....	149	Keying .....	156
InterNIC .....	149	Kilobyte - kB .....	156
Interoperability .....	150	Kilohertz .....	156
Intra-LATA .....	150	Kilowatt - kW .....	156
Intranet .....	150	Kiosk .....	156
IP - Internet Protocol .....	150	Knowbot .....	156
IP Address - Internet Protocol Address .....	150	Ku-Band .....	156
IP Multicast .....	151		
IP Telephony .....	152	<b>L</b>	
IRC - Internet Relay Chat .....	152	L-Band .....	157
IRD - Integrated Receiver/Decoder .....	152	LAN - Local Area Network .....	157
IRQs - Interrupt Requests .....	152	Land Mobile Communications .....	157
ISA - Industry Standard Architecture .....	152	LAN Emulation .....	157
ISDN - Integrated Services Digital Network .....	152	LASER .....	157
iSKY .....	153	Laservision .....	157
ISM - Industrial, Scientific and Medical ...	153	LATA - Local Access and Transport Area .....	157
ISO 900 .....	153	Layer .....	158
Isosynchronous .....	153	LCD - Liquid Crystal Display .....	158
ISP - Internet Service Provider .....	154	Leased Line .....	158
IT - Information Technology .....	154		
ITFS - Instructional Television Fixed Service .....	154		
ITS - Intelligent Transportation System ...	154		
IVDS - Interactive Video Data Service .....	154		

LED - Light Emitting Diode.....	158	Mask .....	164
LEO - Low Earth Orbit .....	158	Master .....	164
LF - Low Frequency .....	158	Matrix .....	164
Line-of-Sight .....	158	MATV - Master Antenna Television .....	164
Link .....	159	MD - Mini Disc .....	164
Link Budget .....	159	MDF - Main Distribution Frame	
Linux™ .....	159	Medium .....	164
Listservs .....	159	Megabit (Mb) .....	164
LMDS - Local Multipoint		Megabyte (MB) .....	165
Distribution System .....	159	Memory .....	165
Load .....	159	Meta Tag .....	165
Local Loop .....	160	Metadata .....	165
Local-into-Local .....	160	Metcalf's Law .....	165
Login/Logon .....	160	MF - Medium Frequency .....	165
Logoff/Logout .....	160	MFJ - Modified Final Judgment .....	165
Longley-Rice .....	160	MFP (Multi-Function Peripheral .....	165
Loopback .....	160	Microchip .....	165
LORAN - <u>L</u> ong- <u>R</u> ange <u>N</u> avigation.....	160	Microcomputer .....	166
Loss .....	160	Micron - Micrometer .....	166
Lossless Compression .....	161	Microprocessor .....	166
Lossy Compression .....	161	Microwave .....	166
LPFM - Low Power FM .....	161	Middleware .....	167
LPTV - Low Power Television .....	161	MIDI - Musical Instrument Digital	
LSI - Large Scale Integration .....	161	Interface .....	167
Luminance (Y) .....	161	MIME - Multipurpose Internet Mail	
Lurker .....	161	Extension .....	167
Lynx .....	161	Mini-Notebook .....	168
		MIPS - Million Instructions Per Second ...	168
<b>M</b>		Mirror .....	168
M-II .....	162	Mixing Console .....	168
MAC - Multiplex Analog Component.....	162	MJPEG - Moving JPEG .....	168
Machine Language .....	162	MMDS - Multichannel Multipoint	
Macro .....	162	Distribution Service.....	168
Magnetic Storage .....	162	Mobile Data .....	169
Mailing List.....	162	Mobile Satellites .....	169
Mainframe Computer .....	162	Modem - Modulator/Demodulator .....	169
Majordomo.....	162	Modulation .....	169
Major Trading Area (MTA).....	162	Monitor .....	169
MAN - Metropolitan Area Network .....	163	MOO - Mud, Object Oriented .....	169
Mapping .....	163	Moore's Law .....	170
MapServe .....	163	Morphing .....	170
Mark-up Languages .....	163	Mosaic .....	170
		Motherboard .....	170
		Motion-Capture Bodysuit .....	170

Mozilla™ .....	171
MP3 .....	171
MPEG - Motion Picture Experts Group ..	171
MSA - Metropolitan Statistical Area .....	172
MS-DOS® - Microsoft DOS .....	172
MSO - Multiple System Operator .....	172
MSS - Mobile Satellite Services .....	172
MTS - Multichannel Television Sound .....	172
MUD - Multi-User Dungeon or Dimension .....	173
Multicasting .....	173
Multichannel .....	173
Multimedia .....	173
Multimedia PC - MPC .....	174
Multimedia Server .....	174
Multi-mode .....	174
Multiplexing .....	174
Multisync Monitor .....	175
Multitasking .....	175
MUSICAM .....	175
Must-Carry .....	175
MUX - Multiplexer .....	175
MVDS - Multichannel Video Distribution System .....	175

**N**

NABTS - North American Basic Teletext Standard .....	176
Nano .....	176
Nanosats .....	176
Nanosecond .....	176
Nanotechnology .....	176
NAPLPS - North American Presentation Level Protocol Standard (or Syntax).....	176
Narrowband .....	176
Natural Language .....	176
Navigation Systems .....	177
Nest .....	177
Netiquette .....	177
NetMeeting™ .....	178
Netscape™ .....	178
Netware® .....	178
Network .....	178

Network Computer (NC) - "Thin Client" .....	178
Network File System (NFS) .....	179
Network Interface .....	179
Network Layer .....	179
Network Server .....	179
Newbie .....	179
Newsgroups .....	179
Next-Generation Internet (NGI) .....	179
NIC - Network Interface Card .....	180
NiCad - Nickel Cadmium .....	180
NICAM - Near-Instantaneous Companding and Multiplexing .....	180
Nielsen//NetRatings .....	180
NIER - Non-Ionizing Electromagnetic Radiation .....	180
Node .....	180
Noise .....	181
NOI - Notice of Inquiry .....	181
NPRM - Notice of Proposed Rule Making .....	181
NTSC - National Television System Committee .....	181
Number Portability .....	181
NVOD - Near Video-on-Demand .....	181
Nyquist Frequency .....	182

**O**

Object .....	183
Objects .....	183
OC-3 (Optical Carrier - Level 3) .....	183
OC Layers - Optical Carrier Layers .....	183
OCR - Optical Character Recognition .....	183
ODBC - Open DataBase Connectivity .....	183
OEM - Original Equipment Manufacturer .....	183
Off-line .....	183
Ohm's Law .....	183
OLE™ - Object Linking and Embedding .....	184
On-Demand .....	184
OnLine .....	184
Online Forum .....	186

OnLine Services .....	186	PCM - Pulse Code Modulation .....	193
On-the-Fly Pages .....	186	PCS - Personal Communication Services .....	193
OOP - Object Oriented Programming .....	186	PCX Format .....	194
Open Architecture .....	186	PDA - Personal Digital Assistant .....	194
Open eBook Standard - OEB .....	186	Peer-to-Peer .....	194
Open Source .....	186	Pel - Picture Element .....	195
Open System .....	187	PenguinRadio .....	195
Open Systems Interconnection - OSI .....	187	Perigee .....	195
Operating System - OS .....	187	Peripheral .....	195
Optical Disc .....	187	Perl - Practical Extraction and Report Language .....	195
Optical Fiber .....	187	Permanent Virtual Circuit .....	195
OROM - Optical Read Only Memory .....	187	Personal Video Recorders - PVRs .....	195
OS .....	188	Phased Array .....	197
OS/2 - Operating System 2 .....	188	PhotoCD .....	197
OSA - Open System Architecture .....	188	Photodetector .....	197
Oscillator .....	188	Photonics .....	197
OSI - Open Systems Interconnection Model .....	188	Physical Layer .....	197
Out-of-Band Signaling .....	188	Picosats .....	197
Output .....	189	PICT - Picture Format File .....	197
Outsourcing .....	189	Picturephone™ .....	198
Overlay .....	189	PIN - Personal Identification Number .....	198
Overload .....	189	Pin-Cushioning .....	198
<b>P</b>		PIN Diode - Positive Intrinsic Negative Diode .....	198
PABX - Private Automatic Branch Exchange .....	190	PIP - Picture-In-Picture .....	198
Packet .....	190	Pixar .....	198
Packet Switching .....	190	Pixel - Picture Element .....	198
Paging .....	190	PKI - Public-Key Infrastructure .....	198
PAL - Phase Alternate Line .....	191	pkZip™/Unzip .....	199
"Palm-top" Computing .....	191	Plain-Text File .....	199
PAM - Pulse Amplitude Modulation .....	191	Plasma Display .....	199
Parallel Port .....	191	Platform .....	199
Parallel Processing .....	191	Playback Head .....	199
Parity Bit .....	192	Plotter .....	199
Password .....	192	Plug 'n Play® .....	200
Patch Panel .....	192	Plug-In .....	200
Path .....	192	PM - Phase Modulation .....	200
Payload .....	192	PNG - Portable Network Graphics .....	200
PBX - Private Branch Exchange .....	192	Point-to-Multipoint .....	200
PC - Personal Computer .....	192	Point-to-Point .....	200
		Point-To-Point Protocol - PPP .....	200

Polarity .....	200	<b>Q</b>	
Polarization .....	201	QA - Quality Assurance .....	207
Polar Orbit .....	201	QoS - Quality of Service .....	207
POP - Point-of-Presence .....	201	QPSK - Quaternary Phase-Shift Keying...	207
POPS - Populations .....	201	Quality .....	207
Port .....	201	Quantization .....	207
Port Replicator .....	201	Queuing .....	208
Portable Document Format™ - PDF .....	201	Quicktime™ .....	208
Post .....	202	QWERTY Keyboard .....	208
Post House .....	202		
Post-Production .....	202	<b>R</b>	
POTS - Plain Old Telephone Service .....	202	Radio .....	209
PPP .....	202	Radio Broadcast Data System .....	209
PPV - Pay-Per-View .....	202	RAID - Redundant Array of Independent Drives .....	209
Pre-Production .....	202	RAM - Random Access Memory .....	209
Presentation Layer .....	202	Rate .....	209
PRI - Primary Rate Interface .....	202	RBDS - Radio Broadcast Data System .....	209
Printer .....	202	RBOC - Regional Bell Operating Company .....	210
Private Network .....	203	RCA Connector .....	210
Privatization .....	203	R-DAT - Rotating-Head Digital Audio Recorder .....	210
PRN - Pseudo-Random Noise .....	203	RDS - Radio Data System .....	210
Processor .....	203	Read-Only .....	210
Program .....	203	RealNetworks .....	210
Progressive Scanning .....	203	Real Time .....	210
Propagation .....	204	Reboot .....	211
Protocols .....	204	Receiver .....	211
Proxy Server .....	204	Record Head .....	211
PSC - Public Service Commission .....	205	Redundancy .....	211
PSK - Phase Shift Keying .....	205	Re-engineering .....	211
PSPDN - Packet Switched Public Data Network .....	205	Register .....	211
PSTN - Public Switched Telephone Network .....	205	Registry .....	211
Public Domain .....	205	Relational Database .....	211
Public Network .....	205	Relay .....	212
Public-Key Cryptography .....	205	Remote Sensing .....	212
PUC - Public Utilities Commission .....	205	Repeater .....	212
Pulse Amplitude Modulation .....	206	Repetitive Strain Syndrome - RSI .....	213
Pulse Code Modulation .....	206	Replication .....	213
Pulse Width Modulation .....	206	Resistor .....	213
Push Technology .....	206		
PVC - Permanent Virtual Circuit .....	206		
PWM - Pulse Width Modulation .....	206		

- Resolution .....213
- Retransmission Consent .....213
- Retrieval Engine .....213
- RF Spectrum - Radio Frequency  
Spectrum .....213
- RFC - Request for Comment .....213
- RFI - Radio Frequency .....214
- RFR - Radio Frequency Radiation .....214
- RGB - Red, Green, Blue .....214
- Rich Text Format - RTF .....214
- Ring Network .....214
- RISC - Reduced Instruction Set  
Computing .....214
- RJ - Registered Jacks .....215
- Roaming .....215
- Round Robin DNS .....215
- Router .....215
- Routing .....215
- ROM - Read Only Memory .....215
- RS-232 .....215
- S**
- S-Band .....216
- S-VHS - Super VHS .....216
- S-Video .....216
- S/N - Signal to Noise Ratio .....216
- Sampling .....216
- Sampling Frequency .....217
- SAP .....217
- Sat Phones .....217
- Satellite .....217
- Saturation .....218
- SCA - Subsidiary Communications  
Authorization .....218
- Scalability .....218
- Scan Conversion .....218
- Scan Lines .....218
- Scanning .....218
- SCMS - Serial Copy Management  
System .....219
- SCPC - Single Channel Per Carrier .....219
- Scrambling .....219
- Screen Real Estate .....219
- Screen Saver .....219
- SCSI - Small Computer Systems  
Interface .....219
- SDARS .....220
- SDTV - Standard Definition Television ...221
- Sea Launch .....221
- Search Engine .....222
- SECAM - Sequential Couleur Avec  
Memoire (Sequential Color with  
Memory).....222
- Sector .....222
- Secondary Colors .....222
- Secure Electronic Transaction - SET .....223
- Secure HyperText Transfer Protocol -  
S-HTTP .....223
- Secure Server .....223
- Secure Sockets Layer .....223
- Seek Time .....223
- Segue .....223
- Self-Diagnostic .....223
- Serial Interface Port .....223
- Server .....223
- Servomechanism .....223
- Session Layer .....224
- Set-top Box .....224
- Shareware .....224
- Shockwave™ .....224
- Shopping Cart .....224
- SHVA / SHVIA .....224
- Sidebands .....224
- Sidetone .....225
- .sigfile .....225
- Signal Acquisition .....225
- Signaling .....225
- SIMM - Single In-line Memory Module ...225
- Simplex .....225
- Simulation .....225
- Single Mode .....225
- Site .....226
- Site License .....226
- SKU .....226
- Slamming .....226
- Slave .....226
- SLIP - Serial Line Internet Protocol .....226

Slots .....	226	Station .....	236
Small Computer Systems Interface .....	226	Stereo .....	236
Smart Appliances .....	227	Still-Store .....	236
Smart Cards .....	227	STL - Studio Transmitter Link .....	237
Smart Home .....	227	Storage .....	237
Smart Terminal .....	227	Streaming Content .....	237
SMATV - Satellite Master Antenna Television .....	227	Streaming Media .....	237
SMDS - Switched Multimegabit Data Service .....	227	Stylus .....	238
SMR - Specialized Mobile Radio .....	228	Subcarrier .....	238
SMTP - Simple Mail Transfer Protocol ...	228	Subnet .....	239
SNA - System Network Architecture .....	228	Subscriber Line .....	239
Snail Mail .....	228	Supercomputer .....	239
Sneaker Net .....	228	Surround Sound .....	239
SNG - Satellite Newsgathering .....	228	SVGA - Super Video Graphics Adapter ...	239
Sniffer .....	229	Switch .....	239
SNR - Signal-to-Noise Ratio .....	229	Switched Multimegabit Data Service - SMDS .....	240
SNV - Satellite Newsgathering Vehicle ...	229	Switched Network .....	240
Software .....	229	Synchronous Transmission .....	240
SOHO - Small Office / Home Office .....	229	SYNDEX - Syndicated Exclusivity .....	240
SONET - Synchronous Optical Network .....	229	Sysadmin .....	240
Source Code .....	230	SYSOP - System Operator .....	240
Spamming .....	230	System .....	240
SPARCstation™ .....	230		
Specialized Common Carrier .....	230	<b>T</b>	
Spectrum .....	230	T-1 .....	241
Speech Recognition /Voice Activation .....	232	T-3 .....	241
Spider .....	232	T-Carrier .....	241
Splicing .....	232	TA - Terminal Adapter .....	241
Spoiler .....	232	Table .....	241
Spooler .....	233	Tandem Office .....	241
Spot Beam .....	233	Tariff .....	241
Spreadsheet .....	233	Taxware .....	241
Spread Spectrum .....	234	TBC - Timebase Corrector .....	241
SQL - Structured Query Language .....	234	TCP/IP - Transmission Control Protocol/Internet Protocol .....	242
SS7 - Signaling System 7 .....	235	TDM - Time Division Multiplexing .....	242
SSL - Secure Sockets Layer .....	235	TDMA - Time Division Multiple Access .....	242
Stack .....	235	Technobabble .....	243
Standards-Setting .....	235	Telco(s) .....	243
Star Switched Network .....	236	Telecommunications .....	243
Star Topology .....	236		

Telecommunications Act of 996 .....	243	Transponder .....	248
Telecommuting .....	243	Transport Layer .....	248
Teleconference .....	244	Trigger .....	249
Teledesic .....	244	Trojan Horse .....	249
Telephony .....	244	True Color .....	249
Teleport .....	244	Trunk Line .....	249
Teletext .....	244	Tuner .....	249
TELNET - TELEcommunications NETwork .....	244	Turnkey .....	249
Telstar .....	244	TV- Television .....	249
Template .....	244	TVDS - Television Data System .....	250
Terabit .....	244	TVPCs/ PCTVs .....	250
Teraflops .....	244	TVRO - Television Receive Only .....	250
Terminal .....	245	Tweening .....	250
Terminal Emulation .....	245	Twisted-Pair - TP .....	250
Terminal Server .....	245	Two-way .....	250
Terminator .....	245		
Terrestrial .....	245	<b>U</b>	
Text File .....	245	UART - Universal Asynchronous Receiver/Transmitter .....	251
TFT - Thin Film Transistor .....	245	UHF - Ultra High Frequency .....	251
Thermal Mapping .....	245	Underscanning .....	251
Thinnest .....	245	UNI - User Network Interface .....	251
Threaded Discussion .....	246	Unicode .....	251
Throughput .....	246	Unique User .....	251
Tie Line .....	246	Universal Remote .....	251
TIFF - Tag Image File Format .....	246	UNIX .....	251
Time Code .....	246	Uplink .....	252
Time Code Generator .....	246	Upload .....	252
Time Division Multiplexing .....	246	UPS - Uninterruptible Power Supply .....	252
Time Shift .....	246	Uptime .....	252
Token Ring .....	247	URL - Uniform Resource Locator .....	252
Toll Office .....	247	USB - Universal Serial Bus .....	252
Topology .....	247	Usenet .....	253
Touch Screen .....	247	User ID .....	253
Touchpad .....	247	User Interface .....	253
Trackball .....	247	User-Friendly .....	253
Traffic .....	247	UTC - Universal Time Code .....	254
Traffic Engineering .....	247	UUencode / UUdecode .....	254
Transceiver .....	248		
Transformer .....	248	<b>V</b>	
Transistor .....	248	V.90 .....	255
Transmission .....	248		
Transparent Mode .....	248		

V-Band.....	255	VRAM - Video RAM .....	264
V-Chip.....	255	VRML -Virtual Reality Modeling Language .....	264
Value Added Network -VAN .....	255	VRU - Voice Response Unit .....	264
Vaporware .....	255	VSAT - Very Small Aperture Terminal .....	264
VBI - Vertical Blanking Interval .....	256	VSB - Vestigial Sideband.....	264
VCR - Video Cassette Recorder .....	256	vt00 -Video Terminal 00.....	264
VDT - Video Display Terminal .....	257	VTR - Video Tape Recorder .....	265
Vector Graphics .....	257		
Vectorscope .....	258	<b>W</b>	
VGA - Video Graphics Array .....	258	W-VHS - Wide-Screen VHS .....	266
VHF - Very High Frequency .....	258	WAIS - Wide Area Information Server .....	266
VHS - Video Home System .....	258	WAN - Wide Area Network .....	266
Video .....	258	Warez .....	266
Video Capture .....	258	Warm Boot.....	267
Video Capture Board .....	258	WATS - Wide Area Telecommunications Service .....	267
Video Codec.....	258	Watt .....	267
Video Compression .....	259	Waveform Monitor .....	267
Videoconferencing .....	259	Wavelength .....	267
Video Disc .....	259	Wearable Computers .....	267
Video Server.....	259	Web .....	268
Video Signal .....	259	Web Clipping.....	268
Video Stream.....	260	Web E-Commerce .....	269
Viewer .....	260	Web Page .....	269
Virtual.....	260	Web Server.....	269
Virtual Channel - VC .....	260	Webcasting .....	269
Virtual Circuit.....	260	Webcasting Radio Receivers .....	270
Virtual Community.....	261	Webhead.....	270
Virtual Path - VP .....	261	Webmaster .....	270
Virtual Private Network - VPN.....	261	Website.....	270
Virtual Reality - VR .....	261	WebTV .....	271
Virtual Set .....	261	Wetware .....	272
Virtual Space .....	262	Whiteboard .....	272
Virtual Walkthrough .....	262	Wideband .....	272
Virus .....	262	Wildcard Character .....	272
Visible Light.....	262	Windows .....	272
Visit.....	262	Windows Media Technologies™ .....	272
VLSI - Very Large Scale Integration .....	262	Winsock™ .....	273
VOD - Video-on-Demand .....	262	Wintel.....	273
Voice Activation/Recognition .....	263	Wipe .....	273
Voice Digitization .....	263	Wireless Application Protocol - WAP .....	273
Voice Grade .....	263		
Voice Mail .....	263		
Vortel -Vertical Portal .....	263		

Wireless Broadband Fixed Access .....	273
Wireless Communications .....	274
Wireless Data .....	276
Wireless Information Appliances .....	276
Wireless Internet Access .....	276
Wireless LAN .....	277
Wireless Web Devices .....	277
Word .....	277
Workgroup Computing .....	278
Workstation .....	278
World Wide Web .....	278
Worldspace .....	278
WORM - Write-Once/Read-Many .....	278
WWW - World Wide Web .....	278
WYSIWYG .....	278

**X**

X.25 .....	279
X-Band .....	279
XDS - Extended Data Service .....	279
XM .....	279
XMS - Extended Memory Specification .....	279

**Y**

Y - Luminance or Y <sup>o</sup> - Luma .....	279
Y <sup>o</sup> /C Video .....	279
Y <sup>o</sup> UV Color System .....	280

**Z**

Z (Impedance) .....	280
Zip Drives/Zip Disks .....	280
Zip/Unzip .....	280
Zoom .....	280
Zulu Time .....	280

